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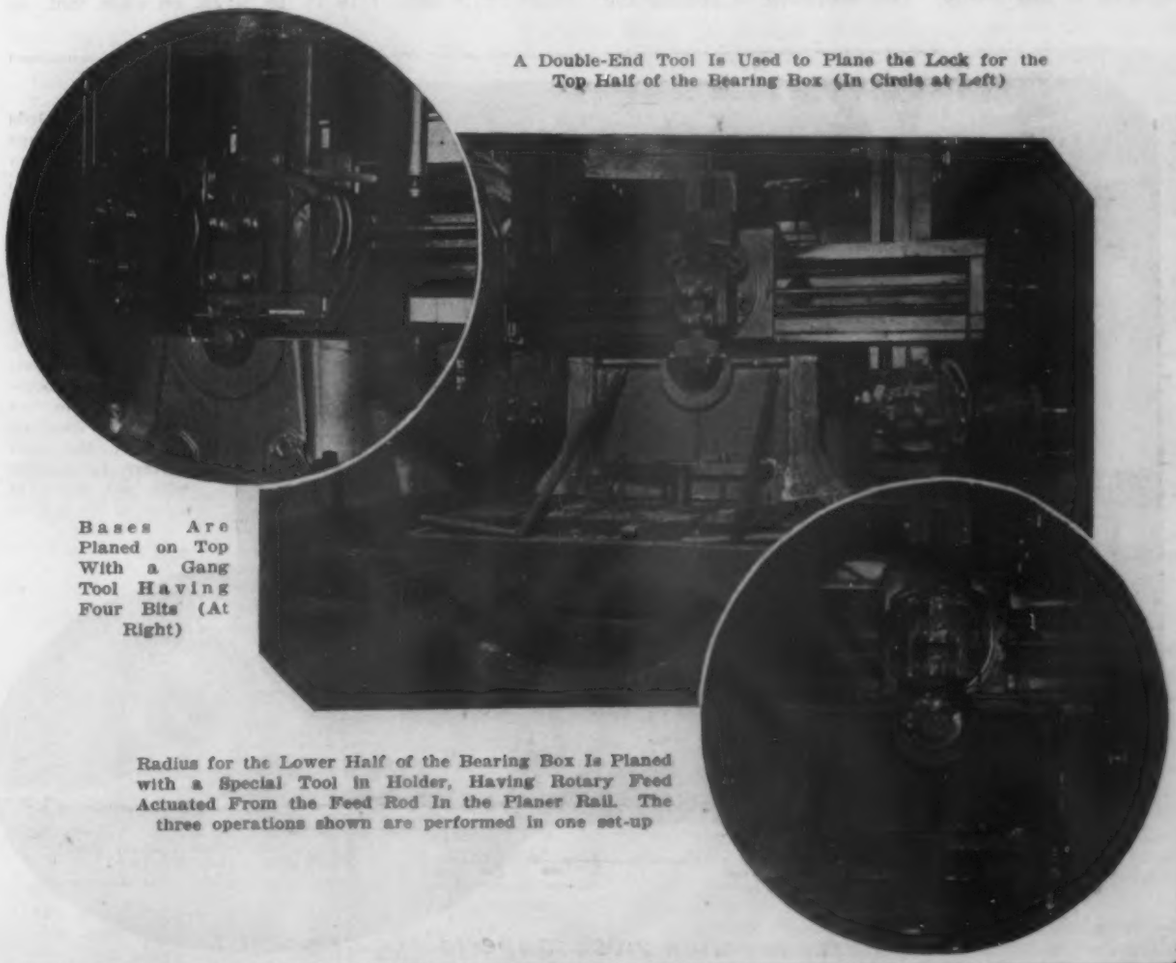
Building Diesel Oil Engines for Ford

Crankshaft Bearings Planed Instead of Bored—Special Fixture Made for Jointing Bedplates—Crankshafts Turned Direct from Forged Block without Preliminary Removal of Stock

BY L. S. LOVE

MANUFACTURING multiple cylinder oil engines on a semi-production basis presents problems of machining which call for marked ingenuity to produce the accurate results desired and at the same time avoid much costly hand fitting and scraping, frequent set-ups, etc.

This is exemplified in the Blake & Knowles plant of the Worthington Pump & Machinery Corporation, East Cambridge, Mass. At this plant are built Diesel oil engines, locomotive feed-water heaters, air pumps and reciprocating pumps. Examples in the present article, illustrative of such practice, are parts of six-cylinder engines built for one of the Henry Ford interests. Another notable phase of this situation is the diversity of methods possible to accomplish similar results, practice in this plant differing in many respects from that outlined in the June 19 issue of THE IRON AGE, page 1777, which described the building of oil engines in another plant, where the methods were likewise a compromise between high production methods and job shop practice. This diversity of practice is largely governed by the machinery available. Most of the work in the Worthington shop is handled on a piece-work basis.



A Double-End Tool Is Used to Plane the Lock for the Top Half of the Bearing Box (In Circle at Left)

Bases Are Planed on Top With a Gang Tool Having Four Bits (At Right)

Radius for the Lower Half of the Bearing Box Is Planed with a Special Tool in Holder, Having Rotary Feed Actuated From the Feed Rod In the Planer Rail. The three operations shown are performed in one set-up

These engines have a sub-base on which is mounted the base proper. This latter contains the main bearings as well as the oil reservoir for splash and force feed lubrication. Above the base is mounted the frame containing the crosshead guides. The top of the frame is machined to take the cylinder and finally the cylinder head.

When the Bases Are in Halves

Sometimes the sub-bases are made in halves, depending upon the size of the engine, which, after planing on the top and joints, are drilled with the same jig, which is reversed for the two halves, so that chance of error in location of holes may be minimized. The top of the sub-base is next drilled with the same jig which is used for drilling the bottom of the main base or bed plate, although this operation is not performed on the bed casting until after the bottom surface and side flanges have been planed, the latter to act as locating guide for the drill jig.

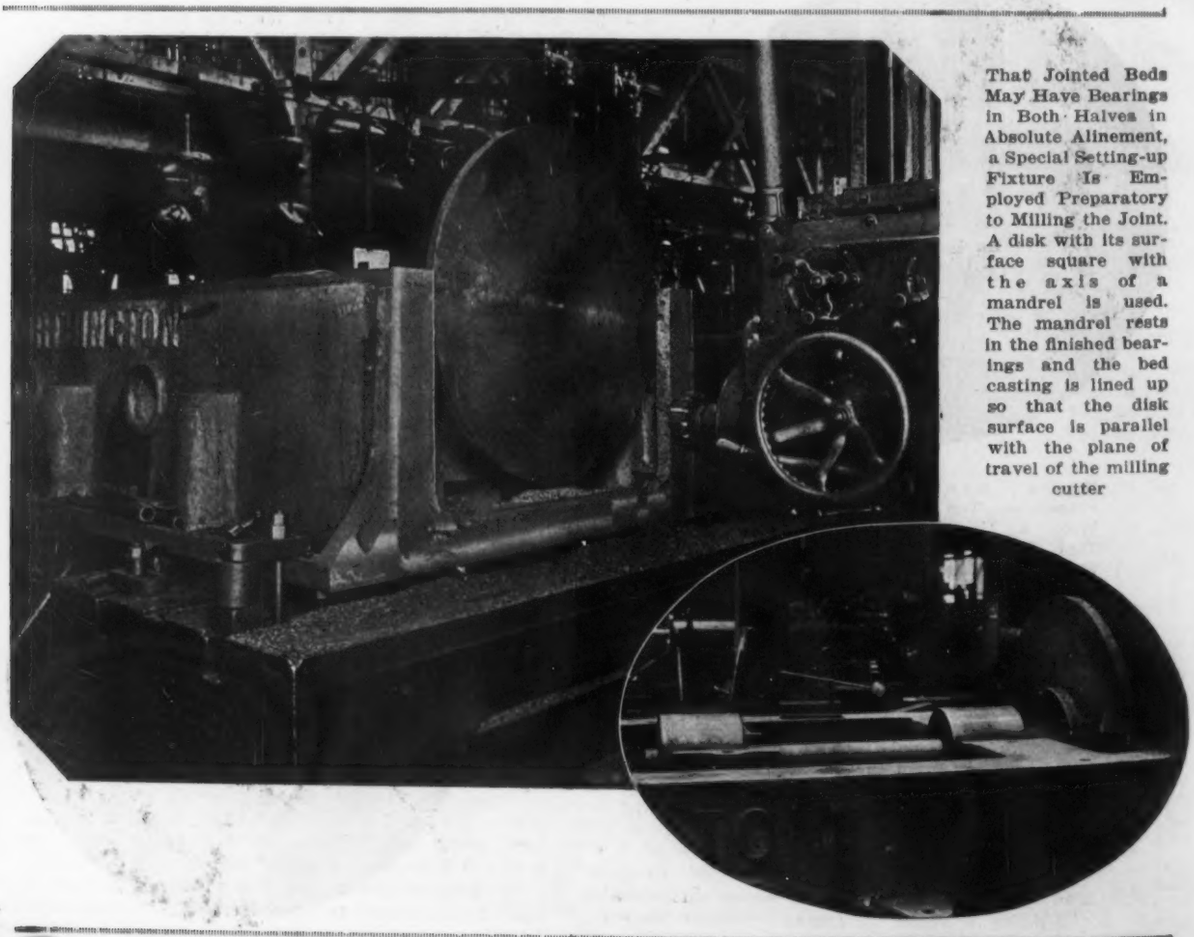
The next succeeding operations on the main base are machining bottom, top surface and bearings for shell. Both of these operations are performed in one set-up on a planer. For the surfaces gang toolholders are used, each carrying four cutting tools which are stepped, providing a normal feed for each tool following the one preceding it. The holder itself feeds an average of 5/16 in. per stroke, varying with the hardness of the casting and the amount of metal to be removed to secure the proper height of the bed plate. This method permits a coarse feed with consequent reduction of planing time but, due to the fact that the tool bits are ground rather square to produce a finish cut and the net feed of each bit is small, a smooth and true surface is secured in the usual way with a broad-nose jointing tool.

In machining the bearings for shells in bed plate, account must first be taken of the fact that, while the lower half of the box is set entirely in the bed casting, the upper portion of the box is separate, composed of a cap, being held in square locks planed in the bed casting in this set-up. This operation of planing the lock is performed with a double-end tool set of two pieces, one for roughing, the second for finishing. The finishing tool is so ground that its length exactly equals the width of the box lock. This double end tool is held in a special holder and is set central measuring from the sides of the bed, care being taken to check the radius for the lower box, that it may clean up from this central position. The tool is fed down to the proper depth, machining both sides of the lock at once.

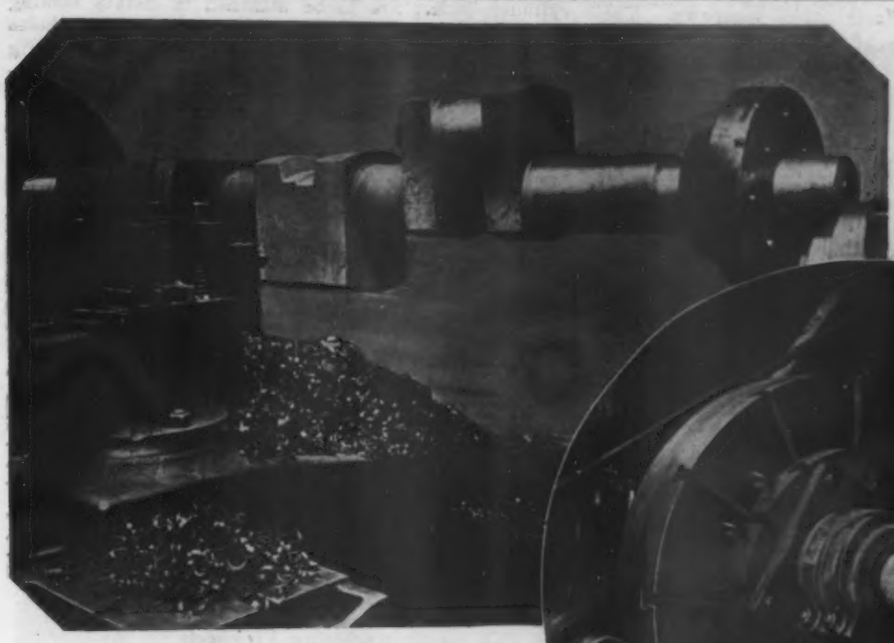
Following is the machining of the radial portion of the bearings for shells, which is done in the same planer set-up by use of a special radius planing tool. Taking as a typical case the base for the Ford engines, the bearing has a diameter of 11¼ in. with the center point 2½ in. below the top surface of the base. The guide or lock for the top half of the bearing box is 11½ in. between sides. In setting the radius tool a dial indicator is used as the pointer of a surface gage, the latter being mounted on a 2-in. parallel block and registering to the center pin of the radius attachment, which pin is 1 in. diameter. Half of this, added to the 2-in. block, sets for the 2½ in. distance of the center below the surface, when the block is removed, and the indicator used to check to the bottom of the bearing radius.

In setting the tool for sweep, a ⅛-in. parallel block is placed at one side of the cap lock. This centralizes the radius with the lock, there being ¼ in. difference in diameter between the lock and the radius. Feed to the radius tool, which is held in a securely clamped rail head, is secured by a worm and wheel arrangement. On the end of the worm shaft is a sprocket actuated by a chain running from a sprocket on the feed rod in the rail. The amount of rotary feed is 1/16 in. per stroke of planer.

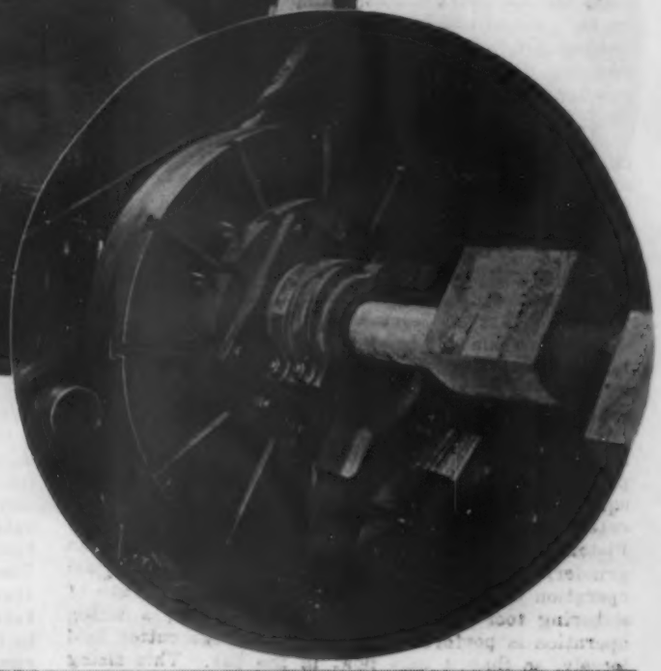
The company has recently put into operation a special tandem radius planing fixture that carries two tools, one at the front and one at the rear, in which each tool is adjustable sideways, so that the roughing chip is divided equally. The rotary feed used on roughing is from 1/16 in. to ⅛ in. on each tool, or



That Jointed Beds May Have Bearings in Both Halves in Absolute Alinement, a Special Setting-up Fixture Is Employed Preparatory to Milling the Joint. A disk with its surface square with the axis of a mandrel is used. The mandrel rests in the finished bearings and the bed casting is lined up so that the disk surface is parallel with the plane of travel of the milling cutter



(Below) An Adjustable Driving Fixture Is Carried on the Counterbalanced Faceplate. This fixture makes for quick setting up



(Above) Crank Shafts Have Pins Turned Direct From the Forged Block. No preliminary operation is undertaken to remove stock for the web or pin. Tail stock end is carried in a disk which has a number of center sockets for accommodating different throws

⅛ in. to ¼ in. total rotary feed for each cutting stroke of the planer table. After the roughing operation, the front roughing tool is removed from the holder and a radius finishing tool is inserted and set to size called for. The distance front to back between the tools is 14 in., or ample to span the longest bearing. Side adjustment is provided for alining each tool. The roughing cutting time has been reduced over 40 per cent, as the tool feed is double the advance of a single tool fixture. The stroke of the table need be increased only 14 in. to clear the second tool. A rotary feed of 3/16 in. to ¼ in. for each cutting stroke of the planer table is used for finishing.

Finally the diameter and depth of the bearing are checked by placing in the bearing a mandrel of proper diameter. A gage block of proper height is placed on the top surface of the base and a surface gage with dial indicator passed over both the block and top of mandrel. The bearings must check for depth and parallelism within 0.001 in. Bearings are gang milled to length, before insertion of boxes, in a horizontal boring, drilling and milling machine.

Getting the Joint Dead Square

Where the beds are made in two pieces, as these six-cylinder machines, it is absolutely essential that the joint be dead square in both directions of finish and in line on the hole drilling, for the top surface and bearings are finished complete before the bed sections are jointed or bolted together. The joint is finished on a floor type horizontal boring, drilling and milling machine. To set the bed level and square on the machine floor plate, a setting-up fixture of rather unusual design is employed. This consists of a mandrel which rests in the finished bearings, having on one end a disk, the face of which is square with the axis of the mandrel. The disk is of a diameter which will just clear the floor plate when the mandrel is in place and permit of its being turned. The job is so set that this disk is equidistant over its entire surface area from the plane in which the machine column traverses. When the setting-up fixture is removed and an end-milling cutter inserted in the machine spindle, the surface machined by it must of necessity be parallel with the disk of the fixture, consequently the joint will be square with the bearing line.

In drilling the holes a jig is used which registers from the bore. Holes are both drilled and reamed with the jig in place, so that body bound bolts may be used. One side of the jig is up when drilling the fly wheel end half of the bed, the other side of the jig is up when drilling the control end half of the bed. This assures a minimum chance of error in alinement of holes. This method avoids necessity of planing beds after jointing, which, due to the requirement for accuracy, would call for considerable outlay of time in setting up and planing.

Obtaining Frame Alinement

To assure proper alinement of frames on these Diesel engines is of the utmost importance. These frames contain the crosshead guides and form the connecting member between cylinder and main base carrying the crankshaft. The first operation on frames is to mill pads on the sides to provide a setting-up surface for machining the frame bottom. In setting up for this operation, it is necessary to register from the guides, that there may be sufficient metal there to clean up in the subsequent operation of boring them. After the manhole cover pads on the sides are milled, the frames are set up for planing on the bottom surface and the sides of the bottom flange. The next operation is to apply the same drill jig which was used for drilling holes in the top of the main base. This is so clamped that the finished edge of the bottom flange in the frame is used as a locating guide. One-third of the holes are reamed, while the jig is still in place. These are used for body bound studs in assembly but are used, also, during the boring operation which follows, for locating dowels.

A special two-spindle machine was designed and built by a machine tool builder working in conjunction

with engineers of the Worthington company. The vertical bars of this machine, 10 in. diameter and weighing about 3000 lb. each, are mounted in saddles adjustable longitudinally on the machine rail. Blueprinted instructions furnished the operator for setting up his work in this machine cover the placing or movement of the auxiliary plates on the machine floor plate. The frames are registered on these plates and dowelled in place, using the holes which were reamed in the drill jig. Immediately under the machine rail are placed templates or index plates with locating pin holes accurately bored out in the tool room. To these the bar saddles are pinned, so that their location in proper position is assured, these templates being in fixed relation to the auxiliary or jig plates on the machine floor plate, to which the frames are dowelled.

In cases where two cylinder frames are to be machined, a pair of frame castings is set up and machined at once. In cases of three cylinder frames, one casting is set up and two of the three guides and cylinder seats are machined. When ready to machine the third bore, a single cylinder frame is set up and bored by the other bar at the same time that the third crosshead guide and cylinder seat are being done. In this way both bars are kept busy simultaneously.

On the frames so bored are mounted cylinders which have their bores ground on an imported cylinder grinding machine with maximum capacity of 20 in. diameter by 48 in. long. Cylinders when set up in this grinding machine are placed in a cradle without use of straps. Holding the cylinder flange against the front plate of the cradle assures that the bore may be ground square with the flange face. An exhauster with hose, entered at the rear end of the cylinder, removes dust. Pistons are ground in the more common type of plain grinder, after the skirt has been bored. In this last operation on the skirt, after rough boring by use of a boring tool in the carriage of the lathe, a sizing operation is performed with a double-edge cutter held loosely, so that it may float in the bar. This sizing cutter bar is held in the lathe tailstock.

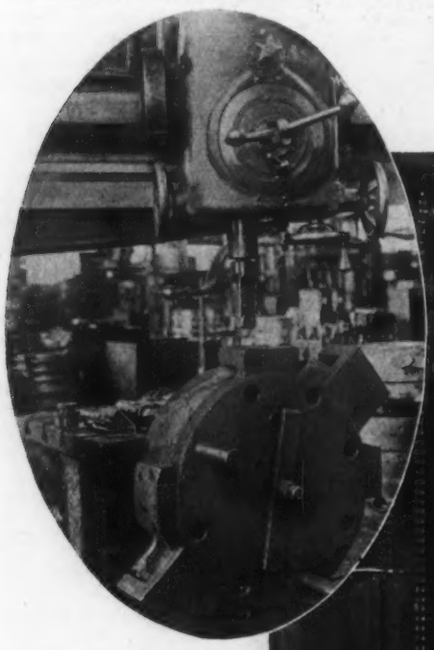
Cylinder heads are first turned and faced in a boring mill. The turning portion of this set-up is merely to turn pads to which water connections from the cylinder jacket are to be attached to convey cooling water to the head jacket. Cylinder head bolt holes are drilled under a multiple spindle drill. The jig used in this drilling operation has ears in which are drill guide bushings for drilling, reaming and tapping for oil connections, as well as drilling for the water connections. The jig in this operation under a radial drill is pinned by two dowels through holes already drilled under the multiple spindle drill.

The water connections are designed with a radius on the flanges to fit the radial pads, instead of being flat, as machining the pads on the cylinder head and cylinder with a radius, while the head or cylinder is set up for turning, is simpler than would be an extra set-up to mill flats on them. It was formerly the custom to produce these radial flanges on water connections in a horizontal boring mill or on a milling machine, whichever happened to be available. A fixture has been designed, and two sizes built, for different sizes of water connections, holding 10 and 13 respectively. These connections when set up in the fixture have the flanges inside on a radius equal to that of the pads on the cylinder jacket and cylinder head. The radius is bored in a vertical turret lathe on the entire number of connections in 1½ hr. as against an equal time for only two connections by the old method.

Machining Flywheels

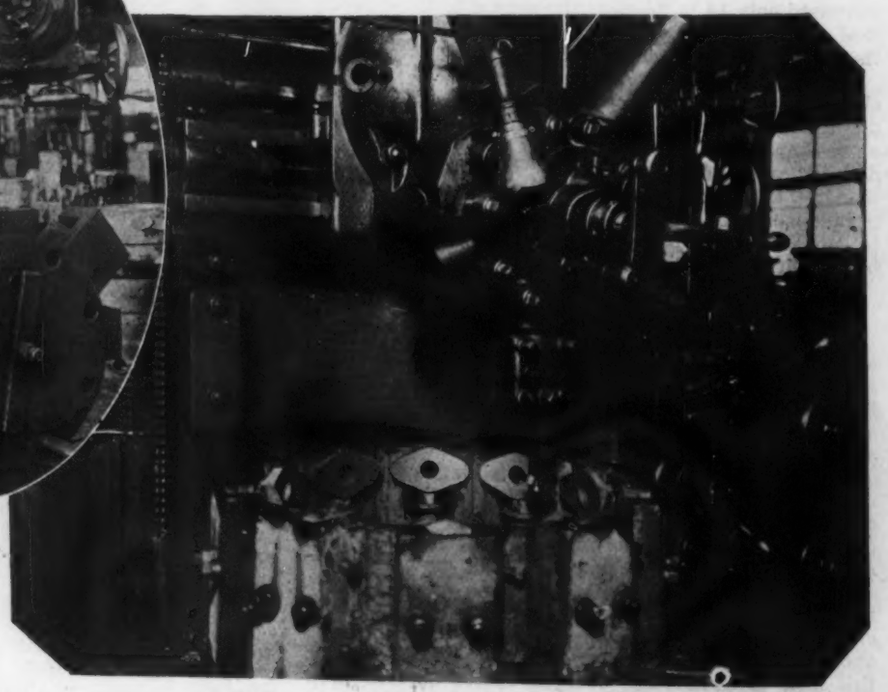
Two time-saving tools have been developed for use in machining flywheels. The wheels are set on a boring mill table and clamped by the spokes while the rim is being turned. A straddle tool has been developed with two bits set to turn simultaneously the two edges of the flange and produce the desired width. The depression in the wheel rim back of the edge is then secured by dropping the straddle tool first to turn the depression on the top. Then the tool is raised to turn the depression on the bottom side of the wheel rim. Turning the periphery is done at the same time, with a turning tool in the other ram of the mill.

After the rim is completed, blocks are placed under it and the clamps released from the spokes to relieve the hub of all strain. The wheel is strapped in place

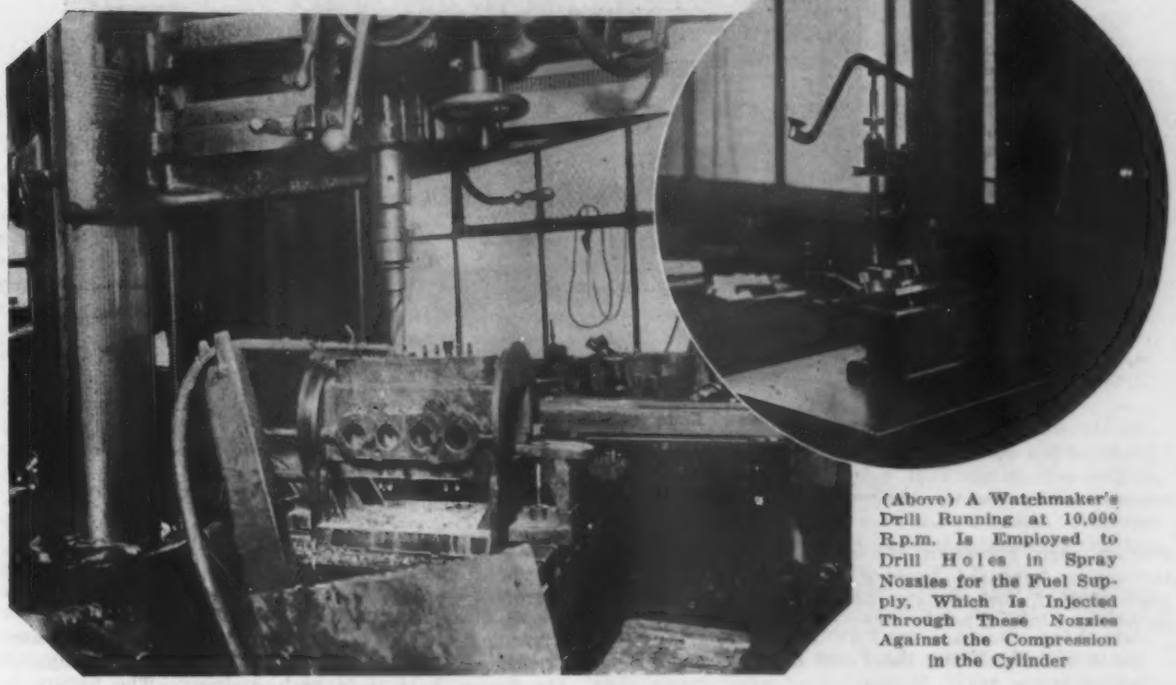


(Above) Cylinder Heads Are Drilled for Water Connections Through a Jig Pinned Through Stud Holes

Water Connections Are Set Up In a Fixture on a Vertical Turret Lathe and Faced to a Radius to Secure Better Fit On the Cylinder and Head (Below)



(Below) A Cradle Jig for Holding Pump Bodies While Drilling Has Effected a Saving of 80 to 90 Per Cent In This Operation



(Above) A Watchmaker's Drill Running at 10,000 R.p.m. Is Employed to Drill Holes in Spray Nozzles for the Fuel Supply, Which Is Injected Through These Nozzles Against the Compression in the Cylinder

on the rim and the hole in the hub bored to a taper. A special taper reamer, held in a universal joint which permits it to float, is then inserted to finish the bore. The reamer has twelve blades, eight of which are simply guides, 0.002 in. under the diameter of the four cutting blades to prevent gouging, as only 0.002 in. can be removed per revolution. In some shops, to get a good true-running flywheel, it is put on an arbor and turned and faced on centers. The flywheels, finished complete on the vertical boring mill, check within 0.002 in.

Crankshafts, Pins and Web Cheeks

Ordinarily in machining large crankshafts it is the practice to slot the forged throw block or burn out the rough outline for the webs and crankpin. In the Worthington plant this practice is not followed, the rough forging being placed in the lathe and the pins turned from the solid block. This method has been found more economical than slotting or burning, as it is faster than the former and less costly than the latter, costing less than the gas needed for burning. In fact, a shaft with 5 in. throw, and 4 in. diameter pin 4½ in. long, is turned floor to floor in 2 hrs. Milling has been tried in an experimental way, but the idea has been abandoned for the present. To make this economical, 1½ or 2 in. would have to be removed at a pass. The need for a machine and 30 to 40-hp. motor is not sufficiently urgent and the saving over the lathe under present production would not warrant the installation.

In turning crank pins an adjustable counter balance is used on the faceplate of the lathe, so that different sizes of shafts may be handled without time-consuming adjustments. Off-center throw blocks, used in the tail stock, have several centering positions in one block. These permit machining of different throws without undue assortment of such blocks being needed. They are limited, however, to the same diameters. Crankshaft counterbalance weights are gang milled to gage in a planer type milling machine.

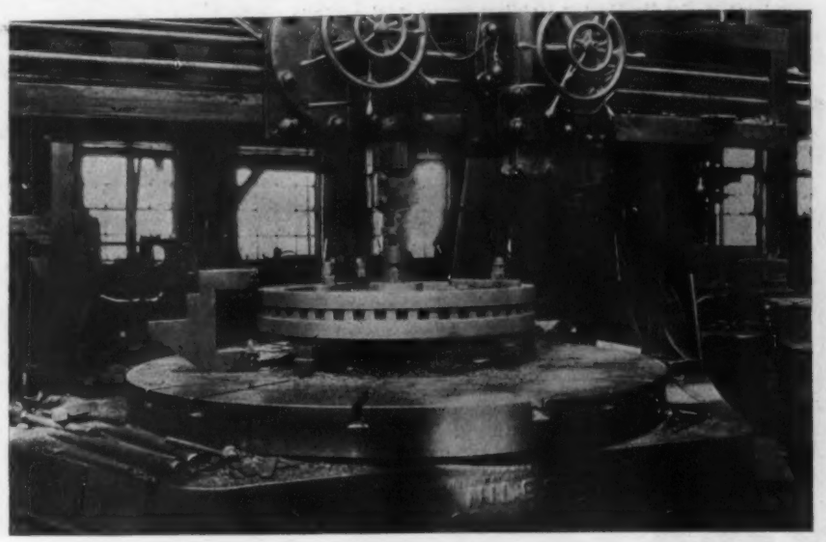
For a slab miller in which crank web cheeks are slabbed, the company is now building a speeder attachment which will be used for milling keyways in the shafts at proper speed, while the shaft is set up for the slabbing operation. A plain milling cutter will first be used, followed by an end mill to square out the ends of the keyways.

Connecting Rod Boxes and Crossheads

After being drilled and reamed for bolts, connecting rod boxes, which are split type, are mounted on an angle fixture in a vertical turret lathe. The shims are in place in this operation so that they also are accurately machined to fit the crank pin, thereby preventing undue oil loss from the bearing. When the bolts in the angle plate are drawn home the box is subjected to the same strains it will encounter when bolted to the end of the connecting rod, thus avoiding cramping in assembly and service.

Naturally, with the bore of the connecting rod box in proper relation with its plain surface through this method of chucking, it will be also in line with the crosshead pin bore in the other end of the rod, if the latter bore is in proper relation to the flat end of the rod which bolts to the box. To assure this accuracy the crosshead pin bore is first ground to limit gage registering square with the box end. It then has a ground bushing with easy press fit forced into it. To check alinement and squareness, the rod is set on parallel blocks on a surface plate and surface gage indicator readings taken from a crosshead pin gage passed through the eye of the rod. These come within 0.001 in., using a checking arbor 12 in. long, and the final fitting is by hand scraping. This same method is used to check pin bores in the cross heads.

Machining these crossheads presents some interesting features. The casting is first faced, counterbored, drilled and tapped on the piston rod end, there being holes to which the rod flange is bolted. These holes are used to register the casting in the boring fixture for subsequent operations. The fixture has an angle plate base to which is attached a pivoting work holder against which the finished side of the crosshead is drawn. Setting-up gage blocks are used to get tools for proper height of shoe pad. The first operation is to face one side and bore for taper crosshead pin, after which the job is swung through 180 deg. to face the opposite side for the pin nut seat. The crosshead is then swung through 90 deg. and the surface faced and turned to receive the babbitted crosshead shoe; then again through 180 deg. for the other shoe pad.

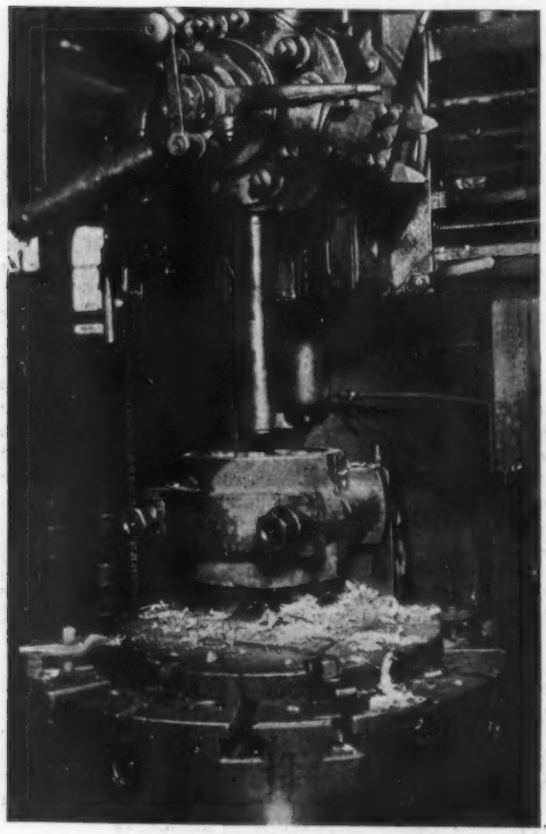


A Straddle Tool for Turning Flywheel Rims the Desired Width Also Turns the Depression Immediately Behind the Edge of the Rim. A taper reamer on a universal joint permits floating. The reamer has eight guide blades and four cutting blades, thereby preventing gouging

During each operation the swivel plate is pinned through a hardened bushing to the main or angle plate of the fixture, so that each operation is positively in correct relation to the other sides.

Machining the Pump Parts

Pump groups for multi-cylinder engines are carried in a single forged steel block, and the plungers work



Connecting Rod Boxes Are Bored While Held Through the Rod Bolt Holes. In this way the same strain is on them as will be present when they are bolted to the rods in assembled engines. Shims are in place in the boring operation

in bushings requiring no packing and practically without leakage, although the oil pressure is approximately 1000 lb. The bushing of bronze, about 5 in. long, is broached with a 1 in. hole. The plunger is ground and lapped into the bushing without abrasive.

After milling on the four sides the pump bodies, which are made from forged steel to insure against porosity, are drilled and tapped complete under a radial drill. The method is to mount the forging in a cradle jig which permits indexing to four positions for holes in each side. Pins inserted in the flange of the fixture hold it in each position. The fixture is mounted on the drill table. Drill guide bushings are held in place by swivel hook clamps. These pump bodies are made in different lengths for one, two, three, four and six-cylinder units. This method has saved 80 to 90 per cent from the previous method, which was the use of a milling machine in the tool room.

At the cylinder end of the fuel feed tube where it enters the injection chamber is a sprayer. The direct opening from the sprayer into the pre-combustion chamber—the nozzle—is a small disk with holes in a circle, drilled at an angle, with one hole in the center. The nozzles vary in size for different engines, although the nozzle body remains the same. The holes, eleven in all, vary in the different nozzles from 0.018 to 0.026 in. in diameter. It is rather odd in a shop handling such large work to find a watchmaker's drill mounted on a bench and running at 10,000 r.p.m. On the table of this drill is a graduated fixture, which is adjusted by a set screw to give the proper angle for the holes. A line on the nozzle is moved successively to the different graduations on the fixture, so that the holes may be properly spaced. Feed is by thumb pressure on a lever pivoted on top of the spindle.

Loan to Peru for Sanitation and Road Work

A loan to the Republic of Peru amounting to $7,000,000 has been arranged by the Foundation Co., 120 Liberty Street, New York. The purpose of the loan is to continue sanitation and road building enterprises covered by contracts previously drawn. The present loan is part of the financing of a $25,000,000 contract between Peru and the Foundation Co., covering road and street construction and the installation of modern water works and sanitary systems in 32 of the principal cities of Peru. Modern highways now being planned for the most populous parts of the country, together with contemplated railroad construction, will solve pressing problems of transportation and will open up rich areas now inaccessible.

The next meeting of the Texas Division of the Southern Metal Trades Association will be held Friday, Nov. 7, at College Station, Texas, upon invitation of Prof. E. J. Fermier, professor of mechanical engineering of the Agricultural and Mechanical College. The meeting will be held in one of the college buildings.

Cooperative Advertising Planned

National Machine Tool Builders' Association Sees Need for Educational Publicity—Members Find Machinery Expositions Too Numerous

THE National Machine Tool Builders' Association adopted tentative plans for an educational advertising campaign at its twenty-third annual convention at the Hotel Aspinwail, Lenox, Mass. A modest beginning will probably be made in 1925, following out suggestions made by a committee of sales managers, and upon the results of this initiatory campaign will depend no doubt the further activities of the association in cooperative effort toward education of machine-tool users.

Another subject which greatly interested the members is the growing number of mechanical expositions at which machine-tool builders are asked to exhibit. A resolution was adopted expressing the opinion that machine-tool manufacturers should confine themselves to exhibiting at not more than two expositions a year, one in the West and one in the East.

These two subjects were injected into the proceedings by reports of sales managers' committees which have been studying them for some months. The advertising committee, consisting of H. S. Robinson, Cincinnati Shaper Co., Cincinnati; E. P. Blanchard, Bullard Machine Tool Co., Bridgeport, Conn.; Louis Hastings, Heald Machine Co., Worcester, Mass., and Frederick Heitkamp, Cincinnati Milling Machine Co., Cincinnati, apparently was not disposed to recommend the raising of a special advertising fund, but suggested that space in leading trade and technical publications going to machine-tool users be donated by members of the association. As a beginning, 15 members had pledged to give at least one page in 1925, and it is the desire of the association that a sufficient number of pages be donated so that educational copy which the association shall prepare will appear in each issue of such publications as may be selected.

Purposes of Campaign

Citing the excellent results obtained by such cooperative advertising campaigns as the "Save the Surface" campaign of paint manufacturers, that of the Davenport Bed Makers of America and the American Malleable Castings Association, the committee declared that the purposes of a campaign by the National Machine Tool Builders' Association should be:

1. To get the buyer to consider the purchase of a machine tool as an investment—a profit maker.

2. To get the user to anticipate his machine-tool requirements and not to wait until the last minute, thus helping to smooth out the production curves and eliminate some of the valleys.

3. To educate the user to buy production, not pounds.

4. To educate the user on the cost and waste of retaining obsolete tools.

5. To fight the used tool evil by educating the user upon the advantages of purchasing new tools.

6. To educate the user on the value to him of the inventive skill and ingenuity embodied in machine tools.

7. To increase the self-respect of the machine-tool industry.

8. To bring the policies, principles and ethical standards of machine-tool builders to the attention of machine-tool buyers in order to establish the verity and legitimacy of all bids and contract rulings, thus to eliminate quibbling on such matters with a consequent reduction of time and effort required in closing sales.

Questions being considered by the advertising committee in advance of its proposed campaign include these: The relative value of various positions in publications; the value of two-color advertising. How can trade paper copy be improved? What are the best methods of reaching buyers, especially the executives who approve of the investment of fixed capital? what is the relative value of different mediums for reaching different classes of industries using machine tools? what kind of illustrations are most effective? how far can advertising go in bringing the buyer up to the sales point?

Too Many Expositions

The report of the sales managers' committee on machinery exhibitions stirred up a lengthy discussion, in which most of the speakers agreed with the conclusion of the committee that machine-tool builders are participating in more of such expositions than is justifiable from the standpoint of results. In adopting a resolution that machine-tool builders should confine themselves to two exhibits a year, the association took the stand that such action could not be binding upon individual members and consequently its action really amounts only to a recommendation. In a questionnaire which had been sent out previous to the convention, those answering as to the exhibit most favored gave first place to the bi-annual exhibit of the railroad supply manufacturers at Atlantic City, N. J. Others favored were the exhibits of the American Foundry-

O. B. ILES

New Officers of Machine Tool Builders' Association

President—O. B. Iles, International Machine Tool Co., Indianapolis.

First Vice-President—Frank MacLeod, Abrasive Machine Tool Co., East Providence, R. I.

Second Vice-President—J. G. Benedict, Landis Machine Co., Inc., Waynesboro, Pa.

Treasurer—H. M. Lucas, Lucas Machine Tool Co., Cleveland.

General Manager—Ernest F. Du Brul, Cincinnati.

Members of Board of Directors—H. L. Flather, Flather Co., Nashua, N. H.; James E. Gleason, Gleason Works, Rochester, N. Y.; Wilson P. Hunt, Moline Tool Co., Moline, Ill.

men's Association, the American Society of Mechanical Engineers at New Haven, Conn., and the American Society for Steel Treating.

One criticism of some of these exhibits is that they frequently are held in cities which are not in the center of greatest machine-tool purchasing power. Detroit is now one of the most important of buying centers, and many of the members at the convention expressed favorable reaction to the committee's suggestion that the National Machine Tool Builders' Association hold an annual exhibit at Detroit in conjunction with the meeting of the Society of Automotive Engineers. Discussions regarding such an exhibit have been going on for some months between the society and the machine tool builders, and it had been expected that the S. A. E. might officially sponsor such an exhibit and conduct it. However, a representative of the society who attended the convention stated that the society had definitely decided not to hold such an exposition, but he extended a cordial invitation to the machine tool builders to do so, providing the latter would assume full responsibility. The position of the S. A. E. is based on the desire of its members to avoid any commercial projects such as an exposition, but the automotive engineers would be glad of the opportunity, it was stated, to see new or improved machines in operation in an exhibit held at the same time as the meeting of the Society of Automotive Engineers. The association's committee on expositions was empowered to continue its investigations with a view to determining the desirability of the association putting on an annual machine-tool exhibition at Detroit.

Address of the President

The annual address of the president, Ralph E. Flanders of the Jones & Lamson Machine Co., Springfield, Vt., was in part as follows:

"Last May, in Buffalo, it was my painful duty to predict that the course of business would be hazardous for some months to come. Putting this conviction into words and pronouncing those words in your presence was not a pleasant task, but it was a necessary one. The knowledge on which the prediction was based was not the exclusive property of your president. It was indeed common to all of us. But it was exceedingly important for the good of individual firms and of the industry as a whole that the unfavorable situation should be stated and faced. Only when this is done can we be sure of the determination needed to shorten sail, and bring our craft around into the wind.

"So much for the past. Let us now undertake the more pleasant work of considering the future. All signs point to a change in the weather. While there are some regions still in distress, the agriculture of the country as a whole is in a most favorable position. Most of the staple crops are of fair size, and the prices for them are unexpectedly high. Farm mortgages are being paid off, country banks are getting onto their feet, and the farmer should eventually come into the market for the many comforts and near-necessities which have been denied him so long. The prosperity of the farmer is a matter of concern to all of us, not only because he is a brother-man, but also because he is the cornerstone of the nation's prosperity. The tides of commerce rise and fall with his buying power.

"To the favorable aspect of agriculture we may add that of the financial situation. Money was never more plentiful or to be had on lower terms. A prospective increase in the demand of consumer goods, and an actual ease in financing equipment for meeting the demand, cannot fail to have a salutary effect on our own future.

"Only the political aspect seems doubtful. Business has quite generally classified the presidential aspirants as Choice No. 1, No. 2 and No. 3, and it seems agreed that the election of Choice No. 2 would not be a really calamitous circumstance. May I be permitted to go further, and to express the opinion that the globe will continue to revolve about its axis, and that the stately procession of the equinoxes will still march on its way, even though the moving van should deliver the personal effects of Choice No. 3 at the White House door next March. Let us calmly and steadily do our duty as citizens, but let us neither place an undue importance on political aid, nor be unduly concerned by political disturbance. Industry will find some way of continuing to function, *provided that it ties itself in with the needs of the social structure.*

"Our hopes for some improvement in business are, then, well founded. We may look for a steady, but perhaps delayed and probably slow, improvement from now on. We must permit no exaggerated hopes for the coming months. We know that the period of rapid expansion in American industry is gone, and with it the reckless optimism which bought equipment with a lavish hand. Our business for the future will come a little harder, and in smaller quantities, even in the best of times; but come it will, on some scale.

"May I now change the subject and refer to what we commonly call the 'ethics' of our business. Our committees on this subject have given it deep study, and have approached it from different sides. We first attempted to define and forbid a multitude of specific abuses. More lately we have been favorably impressed with the excellence of the general statements formulated by the Chamber of Commerce of the United States, and I believe we will have a report from our committee based upon those statements. I wish to approach the matter from still another direction, not as a suggestion for formal action by the committee or association, but as food for thought on our part as individual manufacturers.

"A reading of the principles suggested by the Chamber of Commerce and, far more, a review of its referenda and other activities for several years past, give a clue to the deeper aspirations of American business. If to that is added the recollection of conversations and correspondence with many individuals, it becomes possible to put in words, however crudely, the destination on which our eyes are fixed and toward which we are moving. The following statements are an attempt to define these ideas.

"(1) It is our duty and our pride to manufacture and distribute only things of use and beauty, serviceable to the truest needs of our fellow men.

"(2) These serviceable products we will produce and distribute with the greatest efficiency of which we are capable, avoiding all waste of human labor or God-given material.

"(3) For our profit we will look to the serviceability of the product and the efficiency of its manufacture, rather than to sharp practices and exorbitant dealings of any kind.

"(4) Our manufacturing organizations will be the object of personal solicitude. We will endeavor to so operate the business and distribute the profits that the individuals composing it shall have the due reward of their loyalty, skill and effort.

"(5) We will particularly endeavor to keep wide open the door of opportunity in the organization. For the safety of the business, of the industry and of the country, it is essential that nowhere shall ability and character go unrecognized and unrewarded

"(6) We will organize and control the business so that it shall have its proportional effect in smoothing out the violent fluctuations of the business cycle; and in particular, we will do all that is possible to protect our own employees from the hardships incident thereto.

"(7) In our personal habits we will avoid extravagance and display, not only as personally unworthy, but as socially dangerous. We will find our personal satisfactions in rational and fitting ways, *and particularly in the successful management of a socially useful business.*

"(8) By precept and by example we will train the coming generation to these views of our duties and privileges, with the hope that they may make continued progress toward a state where all who play the game of life may be rewarded with its highest satisfactions.

"Such aims as these may be held modestly and without pious cant. They involve no real self denial or sacrifice on the part of the business man. They are simply a recognition of the durable satisfactions of life

as distinguished from the shallow and transient ones.

"Particularly are these aims essential to our political stability. If the deepest current of American industry sets in this direction, we will not fear what government may do to us. So long as there is injustice, abuse of privilege and cynical self-seeking in American business, so long will the politicians have it in their power to bring disaster to the business structure and distress to all the unfortunates, great and small, whose bread depends upon it. If, on the other hand, we manfully mold and control that structure, it will dominate political activities by virtue of its effectiveness and service. Then and only then will the professional politicians play the minor part to which nature assigned him, and government become the servant instead of the master of our lives."

Report of General Manager DuBrul

Ernest F. DuBrul, general manager, covered fully the current activities of the association, dwelling on its aims and purposes in seeking to improve conditions in the machine-tool industry both for its members and customers. His report first covered the business situation regarding which he said:

"At our White Sulphur convention in 1923, we stated that our statistics indicated that we had probably passed the crest of orders for that cycle. At our October meeting last year, we stated that we were then in a normal downward swing. This swing continued downward until June of this year, which marked the bottom. Since June there has been some slight improvement each month, and we now consider that we have entered on a normal upward swing that ought to progress at an increasing rate for some months to come.

"Indexes of other business have shown that we are entering on a new cycle, and one that should produce as much or possibly more business in 1925 than was had in 1923. The second-hand market is much cleaner of good tools than it was this time in 1922. Foreign conditions are much better, railroads are handling more freight, money is more plentiful, and the recession of general business this year was much less than in 1921. So, all things considered, it would not seem imprudent to plan for business on a basis say of the average demand for the last quarter of 1922, and perhaps a little better. The greater part of this demand will be replacement demand, and will go to those lines of tools that are most up to date in design, of course.

What the Association Has Done

"Four years ago, in October, 1920, the annual convention of this association voted to increase the activities of the association and authorized the necessary expenditures to that end. Enough time has now elapsed to take a perspective view of what had been done, and to consider whether the increased expenditure has been justified. Neither semi-annual nor annual reports can give much perspective. It will be valuable in considering policies, to have a broader survey of the work you have been supporting.

"In the years before, the association had done its members much good, but it had never caused them to study any of the deeper fundamental forces by which their business craft was tossed about, to their frequent distress. They were dimly perceived, of course, but they were far from clear to the industry itself. The effects of these forces had never been brought to the attention of the industry's customers in any way. Lack of understanding by your customers has built up an amount of sales resistance that will take some more years of education to break down. Lack of understanding by the industry itself has created other conditions that will take some more years to eradicate. Neither your customers nor you yourself realized the extent of idleness that cut down your profits to a level that left a low rate of return in exchange for supplying the world with the master tools of industry. Nobody has analyzed those facts, and no one has been crying them from the house tops, so that both the industry and its customers could hear and heed. Essentially that was, and still is, the work in which you joined when you enlarged the association activities.

"Previous to 1920 you knew that your own business fluctuated violently in its demand, but you did not know how violent that fluctuation was for the industry as a whole. You were dimly conscious that all your selling efforts were futile to prevent sudden recessions. Bitter experience proved that it was impossible to stimulate orders by making prices that were disastrous to you. Your sales volume would go low because your customers did not order many units, and you would push the sales volume still lower by cut-throat competition, based on ignorance of true costs.

"You did not know that when you tried a policy that succeeds in some lines where there is an elastic demand, it was bound to fail in your business where demand is inelastic to a greater extent than almost anywhere else. You were bucking into an economic law that you could not change. You tried to buck through sand bars instead of waiting for the tide to carry you over them. If you had not victualled your ship so that you could wait for the tide, you just starved or went on pretty short rations.

"You did not know how your demand is affected by the changing conditions of the business tides. You had given little thought to them, and of course you could not say that one time or another was best to stock or liquidate. To play safe, you generally overstocked at the wrong time, and liquidated at a loss.

"It was necessary to chart those tides and to study them as other industries had done, so that you could avoid these mistakes of policy that had cost you so much of your hard-earned rewards in every cycle. Some of you had studied such facts after a fashion, but this study was casual as well as individual. The facts of the industry had never been collectively considered. Mistakes of the unwise affected the wise, because those mistakes made bad competitive conditions. None of you escaped injury because unsound practice by one spreads the rot of demoralization to others. You don't and can't live unto yourself alone. Experience proves that it is better to teach the unwise how to avoid the rocks than it is to have him getting in your road as a water-logged wreck."

The Used Tool Problem

Various committee reports were presented, including those of the committees on advertising and expositions, already referred to. The committee on standardization of catalog sizes recommended the adoption of standard sizes, but will make further reports to the association on its investigations. The committee on second-hand tools, which has been attempting to improvise a classification of used equipment somewhat along the lines generally adopted by automobile manufacturers, was unable to present definite recommendations. Its investigation apparently convinced the committee members that a classification according to the age of the machines, as is done with automobiles, is impractical for the reason that a machine carefully used for eight or nine years may actually be worth as a marketable proposition more money than a machine only one year old which has been subjected to extraordinarily hard usage. No action was taken on the committee report.

The committee on obsolescence of drawings, jigs and patterns recommended that the association members adopt a plan whereby repair parts would be supplied promptly from stock within five years of the original purchase of a machine tool; that parts be supplied on order after the five-year period had elapsed and that the seller assume no obligation to supply repair parts after a machine had seen service for ten years. There was a disposition to decline to furnish repair parts to second-hand dealers after a machine had undergone a certain period of service. The committee will continue its work and report again at the next meeting. A progress report on standardization of tee slots was submitted and the association was informed that a questionnaire will go out shortly inviting suggestions as to the standards to be adopted.

L. F. Adams, representing the Electric Power Club, discouraged the efforts of the association toward standardization of electric motor dimensions by saying that

such a change would cost the machine-tool using industries of the United States at least $50,000,000; that it would increase the cost of electric motors from $100,000,000, their present annual selling value, to $110,000,000 and that furthermore it was doubtful whether all manufacturers of electric motors would agree to adopt such standards. Mr. Adams said that the General Electric Co. had built experimentally several motors conforming to the sizes and dimensions suggested by the machine-tool builders, and he explained the technical difficulties involved in meeting the wishes of machine-tool manufacturers.

Several addresses were delivered on subjects of pertinent interest to members. That of Frank C. Page, manager of the resolutions and referenda department of the Chamber of Commerce of the United States, resulting in the indorsement by the association of the principles of business conduct adopted by the chamber at its May convention. A committee of the association was empowered to work out a supplementary code of ethics directly applicable to the machine-tool industry.

Emphasizing "Style" in Tools

L. M. Waite, East Orange, N. J., a machine-tool man of long experience in selling, presented several ideas which were afterward favorably discussed by his hearers in a paper on the subject, "How Can the Machine-Tool Industry Help Itself?" Mr. Waite suggested that machine-tool builders follow the ideas of automobile manufacturers, furniture manufacturers, house builders and others in changing styles of design, emphasizing the style feature as it has not hitherto been done in the machine-tool industry. Mr. Waite pointed out that "style" is a thing not solely applicable to clothes, and that reasonable changes in styles of machine tools would carry a sales appeal to those enterprising manufacturers who follow the popular ideal of having the "latest and best." Further, Mr. Waite suggested mergers of existing companies engaged in manufacturing machine tools and the cutting down of excessive machine-tool manufacturing capacity by the disposal of plants not now needed for supplying the normal demands of machine-tool users.

Tax Relief

The intricate problem of relief from adverse decisions of the Internal Revenue Bureau on corporation tax claims was thoroughly discussed by Robert N. Miller of the firm of Miller & Chevalier, income tax consultants, Washington, who provided one of the most interesting features of the convention, judging by the number of questions addressed to him from the floor. Mr. Miller attached considerable importance to the newly created Tax Board of Appeals and urged claimants not to let their claims lapse merely because of difficulties which have been encountered with bureau officials in obtaining adjustments in tax disputes. Mr. Miller said that the new Tax Board of Appeals might be expected to give impartial hearings to all claimants for tax relief and that under this plan the officials of the bureau would not be both judge and advocate.

L. H. Olson, vice-president American Appraisal Co., New York, delved thoroughly into the subject of plant appraisals whether for tax purposes or determination of costs of doing business, also dealing with the question of fire insurance.

W. R. Rastall, chief of the Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, who has recently returned from a trip of several months in Europe, discussed European conditions as affecting the demand for American machine tools. His remarks are published elsewhere in this issue.

Taking as his subject, "No Safe Cut to High Production," Prof. Henry H. Farquhar, Boston, discussed various shop problems. "Most of the failures in serious attempts to increase production in manufacturing plants are directly attributable," he said, "to the installation of some sort of incentive or production payment scheme before the necessary foundation has been laid and to the installation of methods and mechanisms not suited to the particular problems and conditions of the business."

Malleable Iron Castings in 1923

Census Bureau reports show the product of 106 malleable iron castings establishments in 1923 to have been valued at $101,165,740. No comparable statistics are available for previous years. The number of persons engaged in this work is given as 30,899, of whom 2808 were salaried employees and 28,091 were wage earners, this being the average through the year. Wages amounted to $43,109,237 and salaries to $7,220,445, a total of $50,329,682, or close to half the value of the product. As the cost of materials was $39,543,219, the value added by manufacture becomes $61,622,521, more than 80 per cent of this amount being the expenditures for salaries and wages. The horsepower used was 69,553, while coal consumed amounted to 891,981 net tons.

Chamber of Commerce of United States Will Meet in New Home

WASHINGTON, Oct. 14—The Eastern Division of the Chamber of Commerce of the United States will hold its mid-year meeting in the new home of the Chamber of Commerce at Washington, Oct. 23-24. President Coolidge will address the meeting on the second day, but the subject of his talk has not been announced. Prominent speakers will address the meeting on the first day concerning national and international topics, the meeting being given over to a discussion of "The Chamber of Commerce of the United States as an Aid to Business."

The plant of the Pennsylvania Drop Forging Co., 937 French Street, Pittsburgh, is being dismantled. Equipment and machinery has been sold to the Max Solomon Co., Pittsburgh, and is being scrapped. It is believed the building will be converted into a storage warehouse.

U. S. Steel Unfilled Orders Increase

Unfilled business on the books of the United States Steel Corporation as of Sept. 30, aggregated 3,473,780 tons, or 184,203 tons more than remained unfilled Aug. 31. In August the unfilled business increased 102,505 tons; in July decreased 75,433 tons; in June 365,584 tons; in May 580,358 tons; in April 574,360 tons; and in March 130,094 tons, while in February it increased 114,472 tons, and in January 353,090 tons. A year ago the unfilled business was 5,035,750 tons, or 1,561,970 tons more than on Sept. 30, last. Following is the unfilled tonnage as reported by months beginning with January, 1922.

	1924	1923	1922
Jan. 31	4,798,429	6,910,776	4,241,678
Feb. 29	4,912,901	7,283,989	4,141,069
March 31	4,782,807	7,403,332	4,494,148
April 30	4,208,447	7,288,509	5,096,913
May 31	3,628,089	6,981,351	5,254,228
June 30	3,262,505	6,386,261	5,635,531
July 31	3,187,072	5,910,763	5,776,161
Aug. 31	3,289,577	5,414,663	5,950,105
Sept. 30	3,473,780	5,035,750	6,691,607
Oct. 31	.....	4,672,825	6,902,287
Nov. 30	.....	4,368,584	6,840,242
Dec. 31	.....	4,445,339	6,745,703

With the repair work and improvements done within the past month or two and that now under way, the British Empire Steel Corporation, Sydney, N. S., will spend about $500,000 according to J. H. McLurg, vice-president of the corporation. Of the amount mentioned about $200,000 was spent on relining a blast furnace, installing an engine in the blooming mill, and in practically rebuilding the mill.

The Cadillac Malleable Iron Co., Cadillac, Mich., is engaged in installing powdered coal equipment in its plant and in building a foundry addition which will increase capacity by 40 per cent.

Machine Tool Situation in Europe

Position of American Manufacturer of Machine Tools in the Markets of Europe Outlined—Question of Representation Stressed

BY WALTER H. RASTALL*

DURING recent years British manufacturers of general service machine tools have brought out a very large number of machines representing new designs, revised designs, or in some instances copies of American designs. Hence the American manufacturer of these general service tools will find it more difficult to secure business in the British market than was the case some years ago. Some in England were of the opinion that it would be impossible to continue to export general service tools to the United Kingdom; others felt that the trade might continue, but would be on a restricted basis. All concerned seemed to agree that British products of this character are not yet up to the American standard.

Again speaking in broad lines, the indications are that the American manufacturer of single purpose tools and special manufacturing tools has as good an opportunity in the British markets as ever. In view of the larger scale of operations there—especially in the automotive industry—there is a better opportunity for the sale of the American product than has ever been the case before—war booms excepted.

High-Caliber Machine Tool Salesmen Needed by Americans in British Markets

For both of the above classes of equipment it is clear that, if the American manufacturer wishes to continue his business in the British market, he should, if possible, arrange for a higher type of salesmanship in those markets, as the only way to sell the special manufacturing tools is by means of salesmen who understand fully the applications of these tools to modern factory production. Similarly, for the general service tools a better grade of salesmanship is necessary to overcome the changed competition that recently has developed in the United Kingdom.

Probably the time has not yet come when it would be good business to make expensive efforts along the above lines, as the United Kingdom is still under serious depression. Generally speaking, industry there is on a restricted basis and the unemployment situation remains serious.

From what I could learn while in England, there is reason to believe that the machine tool industry there is operating at about 60 per cent of capacity, and 80 per cent of this production is exported. These figures indicate that the consumption of machine tools in the United Kingdom is still small, but they also indicate that the British manufacturer is enjoying a larger proportion of business from foreign countries than are the American manufacturers.

German Situation Under Dawes Plan to Be on a More Normal Competitive Basis

In Germany, at the time I was there, conditions were so disturbed as to make it exceedingly difficult to arrive at satisfactory conclusions. At that time the London Agreement had not been settled and all Germany seemed to be waiting to learn whether the Dawes plan would be adopted, for until some decision was reached it would be almost impossible to know what the future prospects of German industry might be.

However, it is clear that unoccupied Germany is exporting about half the volume of machinery that old Germany exported in 1913 and, while reports from some sources have suggested that the machinery trade of the world would pass into German hands, the best information so far received indicates that this is in no sense true. The German position in the machinery markets of the world today is far below the position occupied in 1913.

Similarly, on the score of price, interesting situations have developed. From certain sources in Belgium and Holland that seem dependable, claims have been made that German quotations on machine tools are still from one-fourth to one-third the American price; in fact, it was added that these quotations apply to machinery that is to be newly built. Contrasting sharply with reports of this character, I was informed in Germany and certain other countries that German costs are now above world market levels and I have every good reason to believe that this is true.

It seems that we have now reached the point where we can hope that German competition will be on a more genuine basis than has been the case during the period represented by the depreciation of the mark, and that German prices will be in line with, if not above, world market levels. However, in this connection it should be remembered that money is very tight in Germany, and that certain manufacturers still have in stock machinery that was produced at the time when the market was at its low levels. Manufacturers holding stocks of this character are frequently in financial distress and are exceedingly anxious to convert these stocks into liquid funds on almost any basis. For some months, it seems probable, equipment sold from stock from Germany will be offered at ridiculous prices and on terms that are absurd.

Need for Ready Cash Suspends Long-Term Credits Heretofore Prevailing

On the other hand, the indications also are that in the future we will hear less about German manufacturers offering machinery on deferred terms. The tightness of the money market in Germany and the difficulties German manufacturers would experience in finding banking accommodations will prevent the sale of machinery by German manufacturers on terms that American manufacturers would consider unbusinesslike.

Apart from these generalizations, it is difficult to report on the machinery situation of Germany, owing to the rapid changes taking place there under the London Agreement, except that it can be stated that German industry and German business are suffering seriously because of the unstable conditions with which they are surrounded.

In France, conditions are far better. Industry there is active and, while certain lines of American machine tools are suffering from increased competition because of new lines produced by French manufacturers, the high-grade American manufacturing and single purpose tools are enjoying a greater demand than ever—war booms excepted. Several of the machine tool importers in Paris reported that for the current year their business was perhaps double that for the corresponding period of 1923.

Central and Southern European Countries as an Outlet for American Tools

In Central Europe conditions are improving, although they have been exceedingly bad there and are still far from satisfactory. Czechoslovakia is actively buying American machine tool equipment and the indi-

*Chief of Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, Washington. Address delivered before Machine Tool Builders' Convention, Lenox, Mass., Oct. 9.

cations are that considerable of this business should be forthcoming in the near future. But the other countries of Central Europe appear now to be passing through the difficult conditions formerly experienced by Czechoslovakia and little business should be expected from those countries until reconstruction has advanced further. On the other hand, business should develop as soon as these areas have reached the degree of reconstruction now attained by Czechoslovakia.

In Italy and Spain there is little to report. Business is moving, but apparently on somewhat the same basis as has been the case during the recent past. On the whole, conditions in these countries seem to be working on to a better basis in response to the factories that are at work throughout Europe, and manufacturers would be justified in giving these markets somewhat more careful attention than was the case a few months ago. Probably the distinctive feature of the existing situation is the need of more careful sales effort in all of these markets; for during recent years a comparatively new machine tool industry has been developed in England, also in Germany, also in France, and to some extent in certain other countries, and American machine tools can be sold in these markets only by means of more carefully executed sales campaign.

Sales Representatives of Nationality of Buyer Are Essential, But There Are Complications

This raises the question as to representation, which has now become of greatly increased importance throughout Europe. For example, in Czechoslovakia the statement is frequently made that the market should be approached only through a Czech. In these areas one finds countless evidences of exceedingly bitter nationalistic feeling. For example, in Prague one of the largest banks in the city has no signboard whatever because a local law requires that any signs exhibited shall be in the Czech language and this German bank feels so bitterly about this that, rather than show a Czech sign, it shows none. Obviously, to the extent that industry in Czechoslovakia is still in the hands of German interests, it will be necessary to approach these industries through German rather than Czech sales channels.

Similarly, in Poland the claim is made constantly that sales efforts should be made through a Pole, but to the extent that industry there still remains in German or Russian hands it would be impolitic to employ Poles as agents.

In contrast with all this, in Vienna one will find machinery dealers who feel that they are prepared to represent American lines throughout all of these countries, and in Germany there are certain dealers who feel prepared to represent American lines, not only in Germany, but in Czechoslovakia and Poland. Obviously, these claims cannot be reconciled and, owing to the intense nationalistic feeling throughout Central Europe, it is clear that the matter is one of great importance. American manufacturers should, therefore, reconsider the entire question of their representation throughout Central Europe and endeavor to market their products there through channels that will effectively reach as large a part of the industries in those countries as possible. It is strongly recommended that this whole subject be considered anew in an effort to improve upon existing sales arrangements for Central Europe.

Similarly, the question of agencies in Italy and Spain needs reconsideration, as some of the most important dealers in both of those countries are either suffering because of liquidations or else withdrawing completely from the territory. As these countries are so placed as to form very competitive markets, the matter should receive most careful attention in the early future.

Col. James Milliken, president Pittsburgh Testing Laboratory, Pittsburgh, will be the speaker at the monthly meeting of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Pittsburgh, Monday evening, Oct. 20. His subject will be "Is Inspection of Material an Evil or a Blessing?"

SEPTEMBER STEEL OUTPUT

Increase Over August About 10.5 Per Cent in Daily Rate—Yearly Rate Was About 33,650,000 Tons

A moderate increase was made in the steel ingot output in September over that of August. The daily rate last month was 108,269 gross tons, as compared with 97,750 tons in August—an increase of 10,519 tons a day, or about 10.5 per cent. The increase in August over July was nearly 36 per cent.

The statistics of the American Iron and Steel Institute show that the September output of the companies which made 94.84 per cent of the country's total in 1923 was 2,669,742 tons. Assuming that the 5.16 per cent not reporting produced at the same rate, a total July output is indicated of 2,814,996 tons. The corresponding annual rate is about 33,650,000 tons, or 62.5 per cent of capacity against 56 per cent in August.

The table gives the production by months of the different kinds of steel, together with the estimated daily rate for all companies.

Monthly Production of Steel Ingots, Reported by Companies Which Made 94.84 Per Cent of the Steel Ingots in 1923 (Gross Tons)

Months, 1924	Open-Hearth	Bessemer	All Other	Calculated Monthly Production All Companies	Approximate Daily Production All Companies Gross Tons
Jan.	2,766,534	667,032	12,577	3,633,639	134,579
Feb.	2,902,641	695,905	14,085	3,809,185	152,367
March ..	3,249,783	706,801	15,260	4,187,942	161,075
April ...	2,575,788	573,381	12,356	3,333,535	128,213
May	2,060,896	425,099	6,648	2,628,261	97,343
June ...	1,637,660	310,070	2,622	2,056,466	82,259
July ...	1,525,912	241,880	5,162	1,869,416	71,901
Aug. 2,042,820		361,781	5,759	2,541,501	97,750
Sept. ...	2,252,976	409,922	6,844	2,814,996	108,269
9 Mos...21,015,010		4,391,871	81,313	26,874,941	114,850
1923					
Jan.	2,906,892	728,270	9,467	3,841,095	142,263
Feb.	2,613,564	669,903	10,797	3,471,843	144,660
March ..	3,046,309	799,525	12,841	4,066,680	150,618
April. ...	2,974,579	772,485	13,933	3,963,736	158,549
May	3,136,558	847,418	16,719	4,216,355	156,161
June ...	2,821,239	737,845	15,483	3,767,256	144,894
July ...	2,658,449	680,884	11,496	3,531,458	141,258
Aug. ...	2,796,370	701,059	9,326	3,695,788	136,881
Sept. ...	2,562,771	613,709	8,602	3,356,776	134,271
9 Mos...25,516,731		6,551,098	108,664	33,910,987	145,541
Oct. ...	2,735,513	649,452	9,163	3,577,091	132,485
Nov. ...	2,348,361	616,335	9,309	3,134,321	120,551
Dec. ...	2,135,898	570,004	10,912	2,863,266	114,531
Total ...32,736,503		8,386,889	138,048	43,485,665	139,825

Exceptionally High Car Loadings

Five new high records are reported by the American Railway Association for the week ended Sept. 27. (1) The 1,087,447 cars loaded during the week was the highest figure for any month this year and the third highest in history. It was only 10,046 cars below the 1,097,493 of the corresponding week last year, which was the highest on record. (2) More cars were loaded with grain and grain products during the current week than in any other week on record. (3) More cars were loaded with miscellaneous freight during the current week than ever before. (4) More cars were loaded with merchandise and "less than carload" freight during the week than in any previous week. (5) More freight cars were moved by the railroads on Sept. 24 than on any other day this year, the total, including loaded and empty cars, having been 1,013,184.

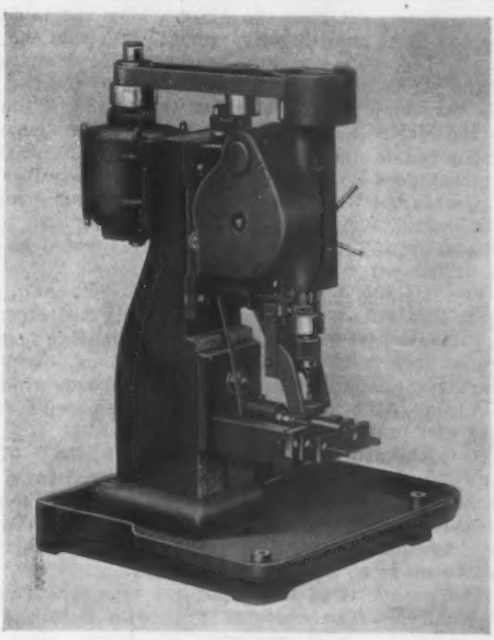
Italian Market Active

WASHINGTON, Oct. 14.—After a slight depression due partially to French and German competition, the Italian market for iron and steel has become active, Commercial Attaché MacLean has cabled the Department of Commerce. The sheet and rod markets are in an especially good position. Production of iron and steel is regular and prices are unchanged. The Lombardy metal manufacturers are offering small increases in wages that affect 150,000 workers. It is rumored that the Fiat Co. has received large orders from Japan and will enlarge its plant.

Automatic Sensitive Drilling Machines

Features of improved automatic sensitive drill heads being marketed by the Kingsbury Mfg. Co., Keene, N. H., include automatic feed which is self-adjusting to meet the variable resistance encountered by the drill in penetrating both the work and space.

A conveniently accessible trip lever for starting a complete machine cycle is also a feature. The spindle travel is under the control of a cam driven by friction gears. The maximum rate of travel is usually several times the rate when the drill is penetrating the work. The gears slip during the drilling or when any resistance greater than can be overcome by the amount of spring pressure provided is encountered. Because of the method of mounting the cam levers this resistance absorbs the spring pressure and leaves the gears in light contact and therefore subject to little wear. The high-speed operation of the drill head is attributed to the comparatively rapid rate of the idle travel of the spindle, and the uniform pressure under which the drill is fed through the work, as fast as conditions will permit, without subjecting the drill to excessive strain and consequent breakage.



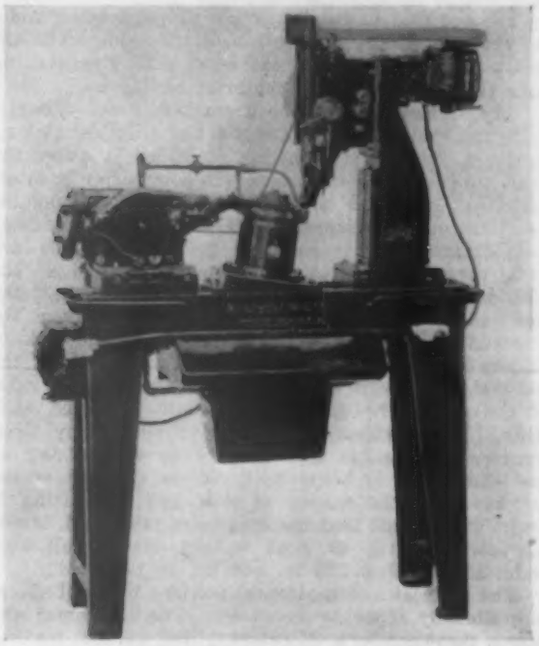
Sensitive Drilling Machine With Universal Fixture. Except for inserting blank to be drilled, all motions are automatic

The application of the drill head to a machine equipped also with the company's No. 82 universal fixture is shown in the accompanying illustration. In this machine the clamping of the work, engaging the power feed, unclamping and removing the work have been made automatic. The work is unclamped and clamped by a slide, which is controlled by the feeding mechanism. The work is ejected forward by a spring plunger, and the spindle feed can be tripped by the backward movement of this plunger as the work is pressed into position. Although machines with horizontal spindles for cross drilling pins can be furnished by the company, the vertical type has been adopted as standard because the work is more easily inserted in the vee-blocks. The vee-block is narrow and open at each side so that chips may be washed away and deflected toward the rear of the machine.

With this fixture 2000 pieces an hour is considered reasonable production. By changing the gage block and clamping jaw the fixture may be adapted to other work than pins.

A recent application of the company's No. 75 indexing fixture, which is an improvement over that previously described in THE IRON AGE, is shown in a separate illustration. The new fixture employed in conjunction with the company's drill heads is said to permit of the automatic handling of a variety of special work. The machine illustrated is set up for the drilling of two small holes in chuck jaws at an angle of 108 deg. to each other. This was obtained by mounting one head horizontally and the other head vertically, which accounts for 90 deg. The fixture was then mounted at an angle of 9 deg. and the work placed in the work dial at an angle of 9 deg. relative to the fixture. The No. 75 fixture is available with either 12 or 24 stations. The work dial averages about 6½ in.

Sensitive Drilling Machine With Special Automatic Indexing Fixture. Set up for drilling two small holes in chuck jaws



Unusual Gas Holder

Announcement was made recently of the award of a contract for a new type of gas holder to be erected for the Public Service Electric & Gas Co., Harrison, N. J., by the Bartlett Hayward Co., Baltimore. This is to have a capacity of 15,000,000 cu. ft.—a size reached by only a few of the largest holders in the world. It is rumored that a much larger holder is to be erected by the United States Steel Corporation at the Gary plant, with a capacity of 50,000,000 cu. ft., as soon as the present holder has proved its qualities.

Instead of using the water seal now commonly employed to prevent leakage, the new holder is to have a tar coated fabric for this purpose, thus doing away with the possibility of freezing in the winter and with the necessity for using steam to prevent freezing. The holder will be 254 ft. in diameter and 333 ft. high. Instead of being circular, the plan of the holder will be polyhedral and it is reported that the design is such that much lighter steel plates can be used than in the ordinary holder.

The Czechoslovak iron and steel industry continues slack, due to a lack of export orders, according to a cablegram received from Commercial Attaché H. Lawrence Groves, Prague.

New Type of Mechanical Hot Bed

Elliptical Moving Members Insure Proper Advance of Rails, Billets, etc., with Less Direct Transfer of Heat— Special Cooling Apparatus

A NEW type of mechanically operated hot bed for handling billets, heavy bars and structural shapes has been developed by Willis McKee, engineer and contractor, 2422 Euclid Avenue, Cleveland. This represents a radical change from the present type of hot bed, long in use for these classes of material, which has skids along which the steel is pushed by hot and cold pull-ups, the hot pull-ups being channel sections sliding on the top of the skids while the cold pull-ups are usually carriages with disappearing dogs that run under the material on the bed.

The McKee hot bed has a stationary set of material supporting members and a set of elliptical moving members, one-half the motion of which is above the fixed supports. By this means the material is intermittently advanced along the bed. It is pointed out that, as the supports are not skids, the bearing surface can be narrower than when skids are used, there is no wear on the supports and as the steel is in contact with one set of supports half the time, there is less direct transfer of heat from the material on the bed to the structure of the bed.

The driving shaft is located half way along the bed and the two parts of the bed on the different sides of the shaft are divided and counter-balance each other. The maximum power required at any time, ignoring friction, is due entirely to the raising of the load which is being conveyed on one end of the hot bed. As the motion is slow and the lifting is slight, it is stated that the maximum peak load, ignoring friction, on a 45 x 45 ft. bed, loaded full with material weighing 225 lb. per ft., is 13 hp.

The vertical and horizontal motions of the bed are controlled by separate eccentrics. The horizontal motion is governed by a Stephenson link motion, making it possible to regulate the speed of travel of material on the bed in any way that may be desired, or the horizontal motion can be discontinued or reversed without stopping or reversing the motor. When desired, the two ends of the bed can have separate Stephenson link motions, thus enabling the operator to control the speed of the two ends of the bed separately. It is pointed out that this adjustment is of great importance as it enables the operator to keep the bed always full or to space the material apart at whatever interval is desired.

When two beds are installed for the same mill, one drive can be used for the two beds, and the peak load on the two beds can be so arranged that the maximum load on the motor will be no more when driving the two beds than when driving one.

When rails are being handled the horizontal travel of the first part of the bed is adjusted so that the rails can be spaced considerably apart from each other so that while cambered the adjacent rails will not touch each other, but when the rails reach the second part of the bed they will automatically be positioned closer together so as to utilize the whole capacity of the bed. This construction, it is stated, not only greatly increases the capacity of rail hot beds, but delivers a much straighter rail, thus decreasing the gag straightening and delivering a rail which will be more satisfactory to the railroads. Gag straightening of high carbon rails is an expensive operation and the railroads have always objected to it on account of the damage to the fiber of the metal.

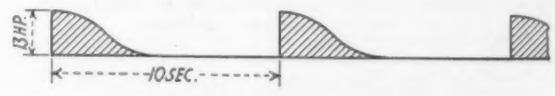
When billets or similar material are handled, the moving supports are cut away at the hot end of the bed so that, after billets are shoved off the run out table against the other billets, they will be automatically spaced apart a pre-determined percentage of their width. This, it is stated, greatly increases the capacity of the hot bed and allows each piece to cool separately with an air current passing up between the billets. It is pointed out that in the ordinary bed the air circulation is not only limited to the top of the billet, but that the air reaching the middle of the bed must pass directly over the billets in the sides of the bed. This greatly increases the temperature of the air before it reaches the center of the bed so it has very little cooling effect at the center of the bed. In the McKee hot bed the air that reaches the center of the bed is underneath the bed and underneath the air that goes up through the sides of the bed so that it reaches the center of the bed without being materially heated. The acceleration of cooling due to the separation of the billets is roughly estimated at from 50 to 100 per cent.

The bed is substantially designed. The main drive shaft is a hollow cast steel shaft with the eccentrics and flanges cast integral with it. The moving members are of structural steel and steel castings, except the bearing castings on the top of the supports which are cast iron. All bearings are large, are removed from the heat and protected from the scale.

It is claimed that the mechanical up-keep of this type of bed will be much less than required for a pull-up hot bed. It is pointed out that pull-up cables fail without warning, necessitating shutting down a mill for immediate repairs, but that repairs to this type can be made at any time convenient.

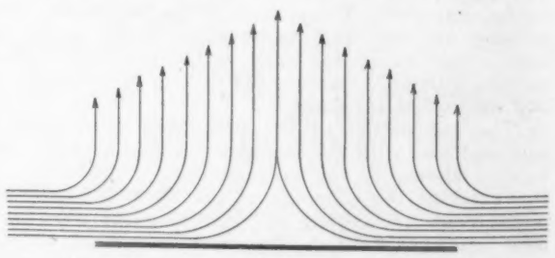
The pusher is of a non-positive type which cannot be jammed. The operator presses a button and a counterweight pulls the piece off the table and when it comes in contact with the other billets, it stops, the swivelled bearing sliding on the rod until the rod on the return stroke of the crank picks up the counterweight and returns the pusher to its normal position when it automatically stops. One operation shoves off the piece and returns the pusher.

The same design of bed can be used in mills rolling smaller material. On such hot beds it is frequently desirable to put the main drive shaft right under the

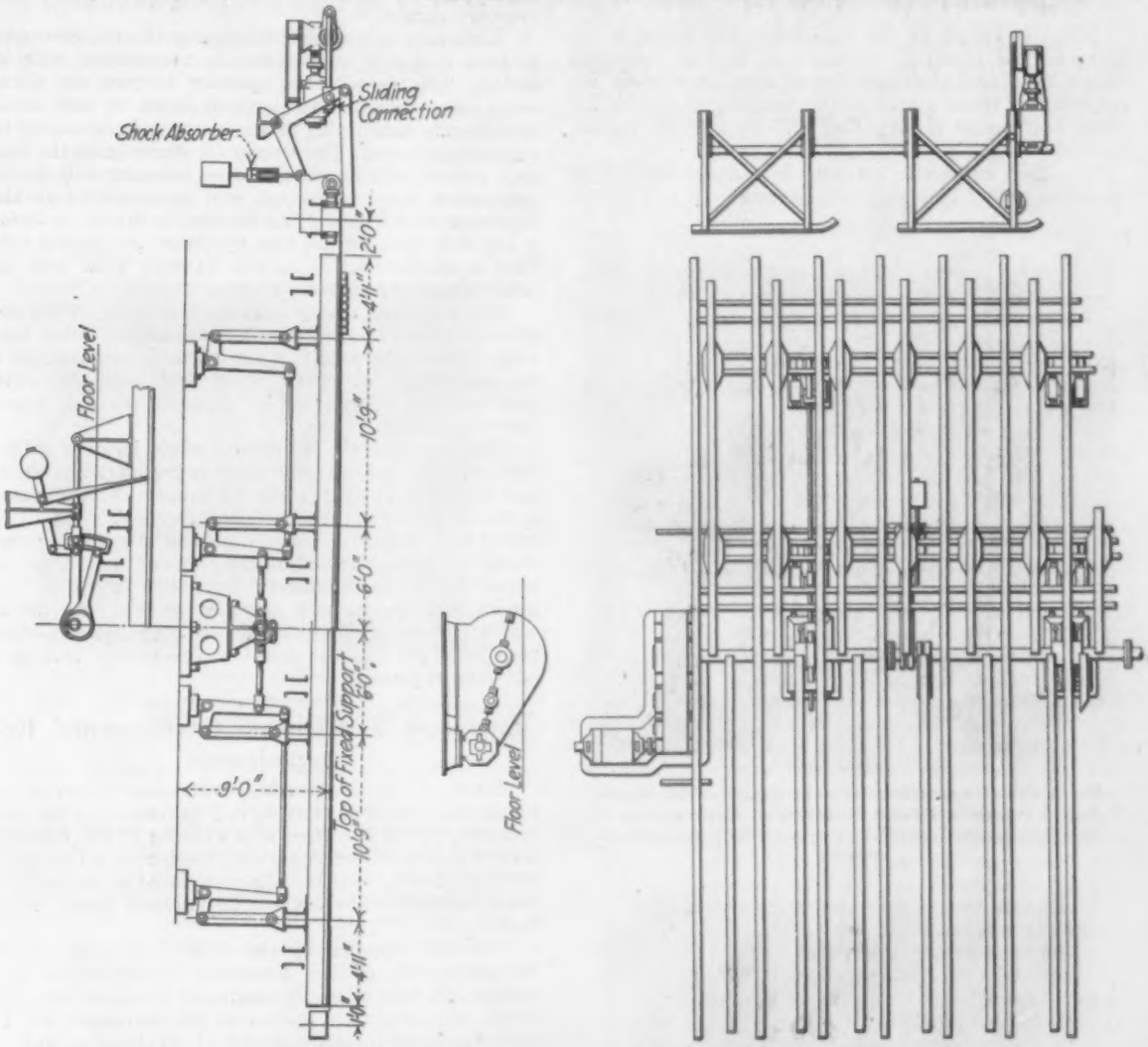


Power Curve Ignoring Friction—Bed Loaded 225 Lb. per Sq. Ft.

Air Circulation Through Billets on McKee Hot Bed



Air Circulation Over Billets on Pull-Up Hot Bed



General Arrangement of the McKee Hot Bed in Plan and Cross Sections

run-out table and make a twin hot bed, or the drive can be put to one side and a single sided hot bed can be built. When handling flats they can be edged in a continuous pack or can be placed on their sides as desired. Many hot beds for small material have their capacity limited by being of the pull-up type, which necessitates a double hot bed for capacity production, or by having a fixed distance between adjacent bars, which necessitates placing small bars at the same centers as wider ones.

While mechanical hot beds for lighter material were brought out later and have been highly developed, practically all hot beds for the heavier material have been built along about the same lines for 40 years. The following are pointed out as objectional features of the standard type of bed for the heavier material: It is impossible to keep the beds full because the steel is usually left where it is first positioned until it is ready to be removed from the bed and this means that one of the beds must always be figured as being empty. While it is possible to re-position the material on the bed after the first material has been removed, thus considerably increasing the capacity of the bed, this necessitates either having the hot pull-ups strong enough to pull the white mass at once or requires the cold pull-ups to move the mass up in a number of sections. If the material is re-positioned by the cold pull-ups, it is necessary to lock down the cold pull-up dogs so that they can return to the other end of the bed. There is considerable stress upon the bed due to the contracting of the material while cooling, which puts a lateral strain on the skids.

Plans of Superior Gas Engine Co.

P. J. Shouvlin, president Superior Gas Engine Co., Springfield, Ohio, writes to THE IRON AGE that it is not true that his company has purchased the Deutz Motorenfabrik Co., Cologne, Germany, but has purchased the complete plant of the Otto Engine Co., Philadelphia. Mr. Shouvlin adds:

"We also purchased in Germany all the rights, patents, refinements and the great engineering experience that they have accumulated in the last 65 years to manufacture, sell and distribute their complete line of full Diesel and airless Diesel engines in the United States, Canada and insular possessions. We will continue to operate the Otto Engine Works, manufacturing a line of Diesel engines up to a certain horsepower. As soon as we can arrange patterns, tools and jigs, we will begin the manufacture of the larger type of horizontal and vertical Diesel engines in our factory at Springfield, Ohio.

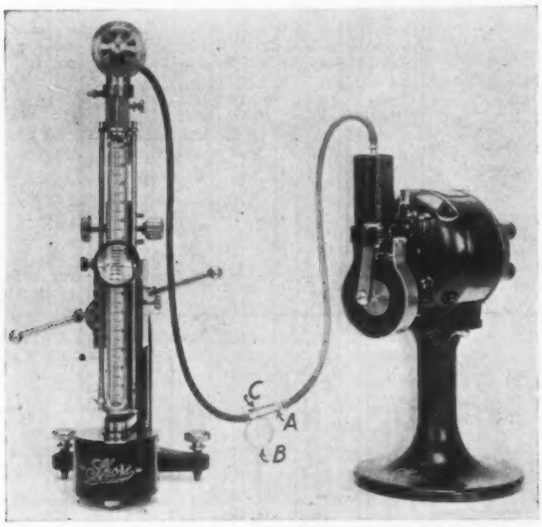
"This new company has a complete line of horizontal Diesel engines that are especially built for shop and factory purposes, also for pipe line and marine service up to and including 500-hp. There is also a complete line of direct driven locomotives that later on we will engage in manufacturing.

"There are a numer of companies in this country manufacturing Diesel engines, but as far as we know, our plans will in no way interfere with any other company engaged in the manufacture of Diesel engines."

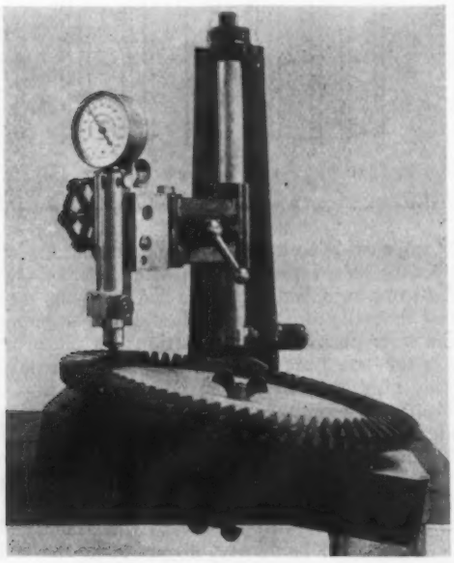
Improved Scleroscope Equipment

What is known as the Sico automatic actuator for operating its model C1 scleroscope, and an improved tilting base and clamping swing arm scleroscope set are two new items placed on the market recently by the Shore Instrument & Mfg. Co., 9025 Van Wyck Avenue, Jamaica, N. Y.

The Sico automatic actuator eliminates the use of the usual rubber bulb and hand pressure. It is intended to relieve the operator of muscular effort and fatigue in mass production operations where hardness tests are made continuously. By means of the device the scleroscope is operated merely by the pressing of a small trigger. The actuator, which is shown at the right in the accompanying illustration, is an electric-pneumatic device which is connected to the scleroscope by a rubber tube. The controller valve fitting is shown at A, the ring by which it is held by the operator's finger is at B, and the trigger valve, which is operated by another finger of the same hand, is shown at C. The electric-pneumatic device runs continuously and has the same suction and compressive force as the usual rubber bulb in the hand of the operator. The device runs at a speed which is correct for operating the scleroscope in ordinary service.



The Automatic Actuator Shown at the Right Eliminates Use of the Usual Rubber Bulb and Hand Pressure. It relieves the operator of fatigue in continuous hardness testing



Non-Portable Tilting Base and Swing Arm Scleroscope Set. Increased range of adaptability is a feature

Tests may be made without using the trigger except to hold it drawn in, making air connections with the motor. This permits the operator to pass the scleroscope over a surface for a rapid series of tests to determine the uniformity of the average hardness of the piece being tested. The timing for drawing up the hammer, release and rebound is done automatically by the slow-speed motor employed, and is calculated so that following each rebound the hammer is drawn up before it can fall back on the test specimen the second time. This is emphasized as saving hammer wear and also economizing the operator's time.

The improved tilting base and clamping swing arm scleroscope set is shown in the lower illustration herewith. This apparatus is a non-portable combination of the company's clamping stand and separate swing arm and post comprising its standard portable scleroscope equipment.

The increased size to accommodate large work is a feature. The heavy tilting table is graduated as shown, and may be set at any angle. A removable center anvil is provided for specimens that extend through. The swing arm, which is mounted on ball bearings, is rigid enough to permit the clamping down of specimens, and it may be set in any lateral or vertical position. The use of this apparatus is intended to eliminate the necessity for most of the special holding fixtures otherwise required for the quantity production testing of odd-shaped pieces.

Engineers Will Discuss Governmental Reorganization

Plans of the engineering profession to aid in the reorganization of the executive departments of the Government will be discussed at a meeting of the Administrative Board of the American Engineering Council at Chicago, Oct. 17 and 18, it is announced at the national headquarters of the council, 26 Jackson Place, Washington.

The bill reported by the Joint Committee on the Reorganization of the Executive Departments, it is understood, only partially meets the wishes of the engineers, who originally sponsored the movement for the abolishment of the Department of the Interior and the establishment of a Department of Public Works.

Engineering activity in the direction of coordinating the public works and construction functions of the Government was revived at a conference in Washington some time ago of more than 50 organizations under the auspices of the American Engineering Council. Definite recommendations, continuing the movement, will be presented to the Chicago meeting.

It is probable that the coming session of Congress will mark forward action by the engineers in the question of Government reorganization.

National fuel conditions will be another topic of the Chicago gathering, a committee of the council having recently completed a nationwide survey of the coal storage situation. The committee's report, comprisng about 100,000 words, will be given out following the meeting. [See THE IRON AGE, Oct. 2, page 859, for summary.]

The coal storage report will recommend the adoption of systematic storage arrangements by cities.

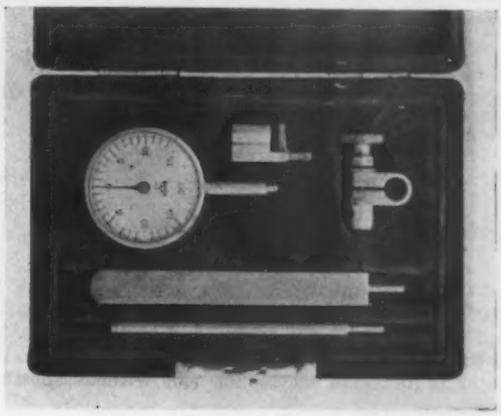
Airmail and commercial flying, cooperation by National Conference on Outdoor Recreation, needs of the U. S. Patent Office, standard contract forms as developed by Joint Conference Committee, the World Power Conference in London, the International Management Conference at Prague, and the Third Pan-American Scientific Congress are other subjects to come up. Ex-Governor James Hartness of Vermont, president of the council, will preside.

In a 16-page pamphlet the Metropolitan Life Insurance Co., New York, has set forth the elements entering into the cost of overhead in operating a business. A plea is made for making each department self-sustaining. The problem of excess capacity is discussed, as well as means of measuring overhead for cost keeping and other purposes.

Dial Indicating Gage for Shop Use

A dial indicating gage designated as model No. 25, equipped with universal attachments and intended primarily for machine shop use has been added to the line of the Federal Products Corporation, Providence.

This equipment consists of a light and sensitive dial indicator, which by means of its attachments may be adjusted quickly to any desired position on a surface or on a height gage. It may be employed in checking



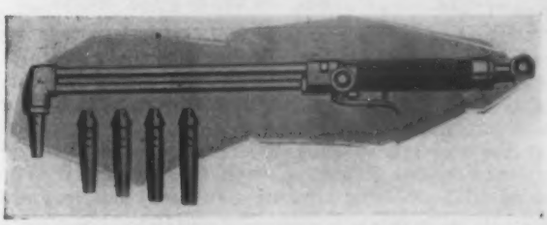
Dial Indicator with Attachments for Checking Work In Machine Tools

work in lathes, milling machines, grinders, shapers and planers. The diameter of the dial of the indicator is only 1 in. and it is graduated in 0.001 in., a complete revolution of the hand being the full range of 0.040 in. The gage and attachments, which are provided with a leather case as illustrated, may be carried in one's pocket conveniently.

New Cutting and Welding Torches

Cutting torches which operate on oxygen in combination with acetylene, hydrogen or other combustible gas and which may be used for welding as well as for cutting have been placed on the market by the Purox Co., Denver. The transformation to the welding torch is by means of a welding tip adapter.

Locating the mixer at the front of the handle and away from the heat of the tip is a feature intended to provide safe operation, constancy of preheating flame and good balance. The front end tubes may be conveniently removed to permit the use of special tubes of various lengths and the use of 45, 60, 75 or 90 deg.



Transformation From Cutting to Welding Torch Is by Means of a Welding Tip Adapter

head angles. The front end may be removed conveniently and the mixer changed quickly. Being assembled in units, repairs on the torches may be made in the field.

The use of a small-diameter valve stem is intended to minimize friction of movement and permit unobstructed flow of gas. The small diameter is said to permit of effective packing against gas leakage, although protected against external strains by a protecting cap of large diameter, which serves also as a housing for the valve spring. The valve is a stainless steel, hardened and ground. The cutting oxygen lever is located on the lower side of the torch handle so that it may be operated by the first and second fingers. It is provided with a latch which locks the depressed valve, the lever being released merely by touching the latch, which stops the high-pressure flow. An adjustment screw compensates for lost motion. The high-pressure lever latch is of stainless steel, hardened and ground. It engages a stainless steel pawl riveted to the inside of the handle.

The flame oxygen needle valve is provided with a knurled wheel which is under the operator's thumb, both the cutting oxygen and flame being under the control of one hand, with the torch held in a natural position. Hose connections on the torches are on the horizontal instead of the vertical plane, which is intended to reduce the drag of the hose on the operator's hand. The style "F" torch is rated as capable of cutting material of any thickness likely to be encountered in steel foundry or steel mill operations. This torch is 25 in. long, weighs 60 oz. and is of 24 in. capacity. The style "E" is 20 in. long, weighs 46 oz. and is of 6 in. capacity.

Combination Wood Saw

A portable electric combination saw for cutting wood up to 2 in. thick has been placed on the market by the Spring Grove Tool & Mfg. Co., Spring Grove, Pa. The machine, which is shown in the accompanying illustration, is equipped with a 10-in. saw which operates at 3400 r.p.m. and is driven by a ½-hp. motor

The table is 24 x 24 in., is of cast iron and provision

Combination Motor-Driven Wood Saw for Cutting Material Up to 2-In. Thick

is made for wood extensions on either side. It may be tilted and locked in any position up to 45 deg. for bevel ripping or miter cutting. The cut-off and miter guide provided may be used on either side of the saw and may be turned to any angle up to 45 deg. right or left, and locked. A ripping fence is provided for use on either side of the saw for ripping material up to 12 in. wide.

The saw spindle and motor are mounted so that they may be raised and lowered by means of a hand wheel and a dado head 1 in. wide may be employed for cutting grooves up to 2 in. deep. An extension on the spindle for boring may be fitted with a drill chuck, as shown. The frame of the machine is of hardwood.

Metals Used in World Cruiser Airplanes

Steel Tubes and Wire and Aluminum Alloys in Fuselage—Alloy Steels and Future Planes

BY J. B. JOHNSON

REALIZING the extent to which metals enter into the construction of the American airplanes which have just completed their record-breaking circuit of the earth, THE IRON AGE *solicited from the author of this article some details for publication. Mr. Johnson is chief of the materials section, air service engineering division, McCook Field, Dayton, Ohio, and speaks with special authority. The world cruisers were built by the Douglas Airplane Co., Santa Monica, Cal.*

THE progress in aircraft construction is analogous in many particulars to that of watercraft. The first materials to be used were those which are easily worked and readily available; therefore the first airplanes were built with wood as the only material for the main members of the structure, such as wing beams, struts and longerons. The lugs and fittings were commercial cold-rolled steel fastened to the structure with stove bolts.

As the development proceeded the demand for better performance led to the introduction of nickel steel for bolts, clevises, pins and similar parts, and a special carbon sheet steel with high physical properties for the fittings. The main structural members were still made of wood or plywood, however, and it was not until after the war that any serious attempts were made in this country to substitute metal.

The most radical developments in all-metal airplanes are the types in which both the fuselage and the wings have been built entirely of metal. In practically all of the designs the metal used for the wings is a heat-treated aluminum alloy which develops a minimum tensile strength of 55,000 lb. per sq. in. Wing beams and ribs are formed from the sheet metal and rolled into shapes, such as angles, channels and corrugated strips. These are riveted together with aluminum alloy rivets. The parts are then assembled into the wing structure and covered with a thin corrugated sheet of the same metal. The rivetting operation is slow and costly, as many thousands of small rivets must be driven in places which are almost inaccessible. The fuselage is built up of aluminum alloy tubes or steel tubes. This type of construction has been used only on experimental airplanes due to the relatively high cost, especially when only a limited production is contemplated. Several experimental airplanes have been constructed, however, and have given good performance.

Wings Still Made of Wood

The type of construction which is used more extensively at the present time is a combination of wood and metal construction. The wings are similar to the older types in that the structure is wood and the covering is doped fabric. The fuselage, however, is made of steel tubing welded at the strut points either by oxy-acetylene or electric welding. This type of construction has been adopted as standard by the Army Air Service and was used on the Douglas world cruiser airplanes. The construction of the fuselages for these airplanes is shown in Figs. 1 to 4.

The fuselage is a built-up truss made of thin wall seamless tubing of comparatively large diameter. The largest tube in this structure is 2 in. in diameter with a wall thickness of 0.095 in. The thinnest tube has a wall thickness of 0.031 in., which is about the minimum which can be used without danger of local failure due to collapsing of the wall. The tubing conforms to air service specifications, which require a tensile strength of 55,000 lb. per sq. in., and at the same time the tube must be sufficiently ductile, so that the outside diameter is increased by 25 per cent without showing signs of cracks.

Low-Carbon Steel in the Fuselage

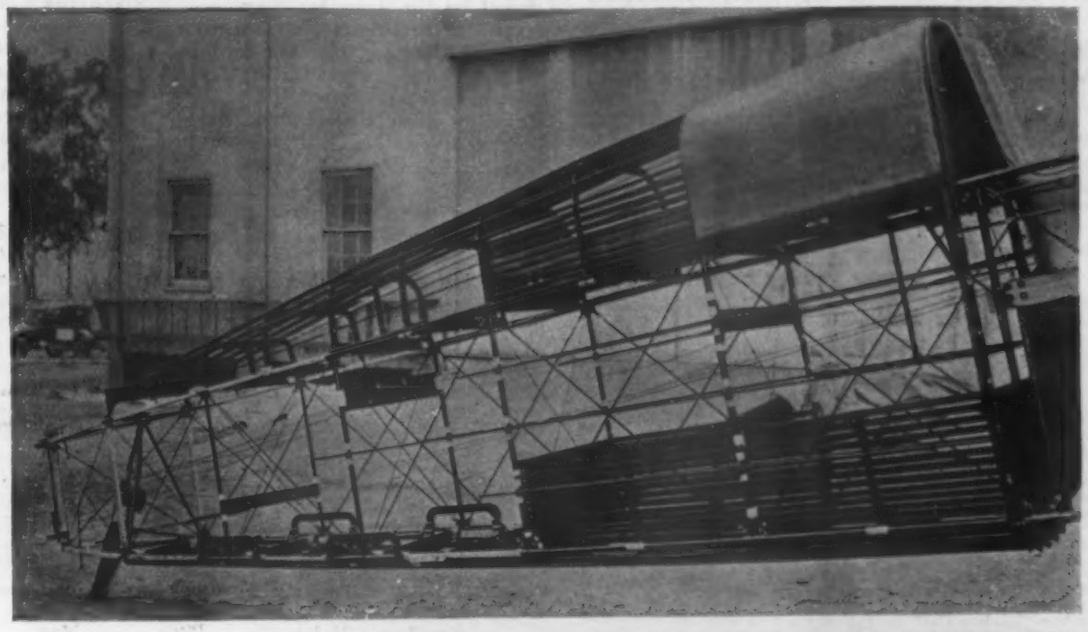
The material in the tubes is a low-carbon steel with a range of from 0.10 to 0.25 per cent carbon. The vertical members are welded to the horizontal members at the junction points by means of an oxy-acetylene welding torch. Due to the danger of warping the structure, no attempt is made to anneal the welds. The tension members of the truss are made of cold-rolled carbon steel wire of approximately 0.45 per cent carbon which has been heat-treated and cold-rolled to an elliptical section and which is known to aircraft engineers as streamline wire. The air service specifications for this type of wire are very exacting, requiring both a high tensile and high bend test. The lugs to which the wires are attached are a cold-rolled sheet steel with a minimum tensile strength of 55,000 lb. per sq. in. and an elongation of 20 per cent in 4 in. This material is of special manufacture and great care must be exercised in the rolling and annealing operation, as the physical properties must be obtained on test specimens cut at any angle with the edge of the strip. This uniform ductility is necessary, as the fittings cannot be laid out so that the bends can be made in any one direction, but may be with or across the grain. The bent axles for the landing gear are made of a nickel steel tubing containing approximately 0.30 per cent carbon and 3.50 per cent nickel. This tubing is heat-treated to a tensile strength of about 175,000 lb. per sq. in.

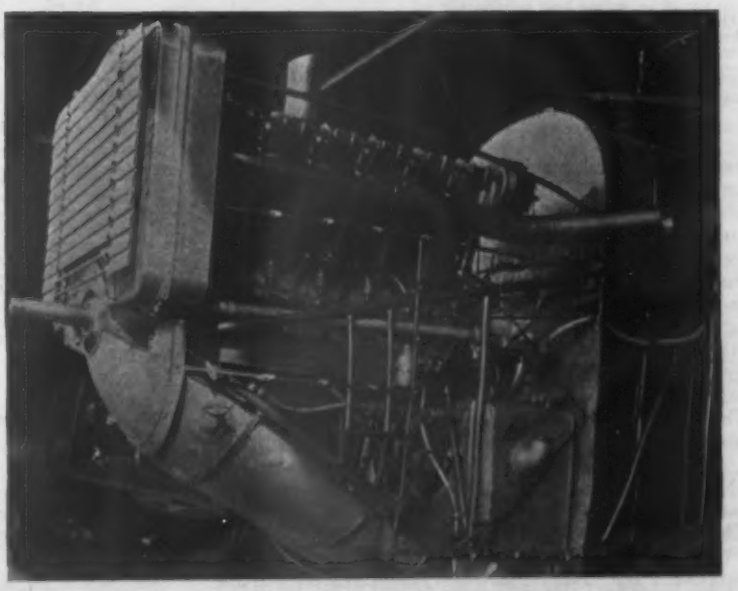
Chrome-Molybdenum and Other Alloy Steels

Chrome-molybdenum alloy steel tubing is now being used in one experimental design for the structural members of the fuselage. It has been found that tubing of this analysis welds satisfactorily. The tubing has a minimum tensile strength of 95,000 lb. per sq. in. and the rapid air-cooling after welding of the thin sections does not reduce the strength appreciably. The use of alloy steel for airplane structures has not been very extensive, since the higher strength cannot always be used advantageously on account of the lack of stiffness which is inherent in very thin sheets or tubes.

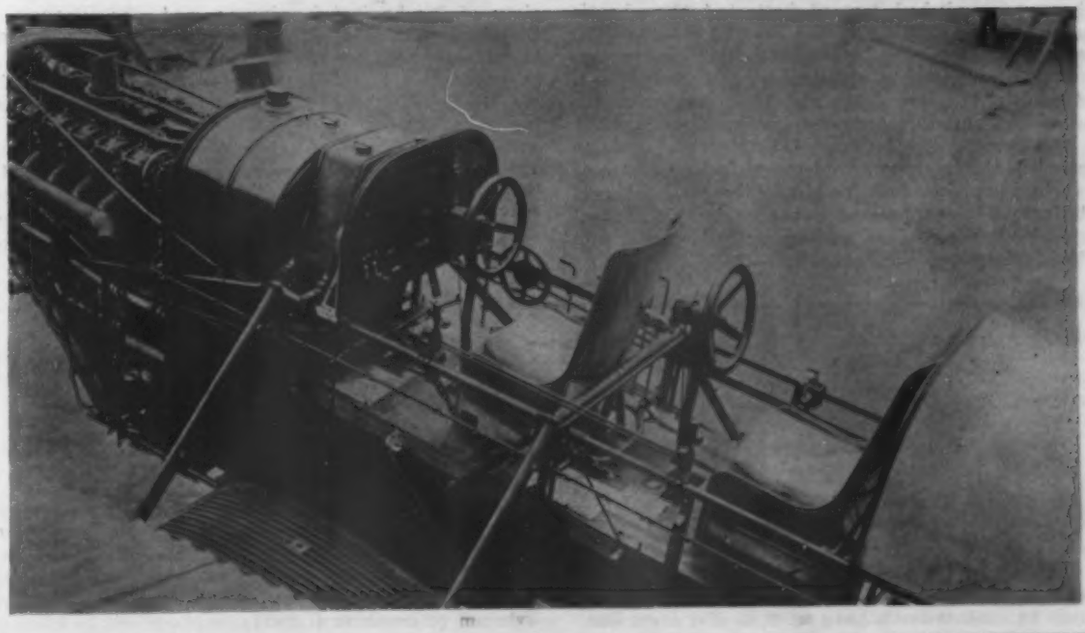
Metals in Future Airplanes

There is little doubt that the future airplane will be built entirely of metal on account of its uniformity and permanency. The sructure will probably be a combination of alloy steel and heat-treated aluminum alloy, developed on the basis of the lightest weight for maximum strength and stiffness.





THE Fusilage and Other Parts of the American Airplanes Which Recently Completed a Successful Circuit of the Earth. These illustrations give some idea of the construction of the main members into which metals enter (Official photographs, United States Army Air Service)



FIRE-HOSE THREAD STANDARDS

Uniform Practice Making Progress—Limiting Dimensions of Threads and Gages Specified

Wide variations in the thread dimensions and types of couplings for fire-hose connections have contributed to heavy loss of life and property incident to the spread of many disastrous fires. The urgent need of one uniform or standard thread for all fire hose couplings, hydrant outlets and special fittings has been recognized for many years.

Manufacturers of fire-fighting appliances and municipalities installing fire equipment are making inquiries regarding a standard for fire-hose threads and in many States the cities and towns are joining in state-wide movements to change their existing threads to agree with the National standard. Much of this increase of interest is due to recent accomplishments under the leadership of the National Board of Fire Underwriters.

There are about 8000 cities or towns in the United States and Canada that have fire-hose fittings in service. Approximately 21 per cent of these are now using the National standard thread and 64 per cent have threads that may be resized readily and made standard.

This standardization movement was originated and fostered by a committee of the National Fire Protection Association. Up to 1917, however, comparatively little had been accomplished toward bettering the chaotic thread conditions existing in the field. In July, 1917, the work was taken over by the committee on fire prevention and engineering standards of the National Board of Fire Underwriters and beginning with the spring of 1919 marked progress has been made. The American Society of Mechanical Engineers has been interested in the interchangeable manufacture phase of the problem, and has lent its aid in the establishment of satisfactory tolerances and in the production of steel gages which make modern gaging methods possible in both the factory and the field.

Table I—Characteristics of the National Standard Fire-Hose Coupling Screw Thread

All dimensions given in inches

1. Nominal inside diameter of hose coupling	2½	3	3½	4½
2. Pitch or number of threads per inch	7½	6	6	4
3. Total length of threaded part of hose and hydrant nipple, external thread	1	1⅛	1⅛	1¼
4. Nipple (external thread) cylindrical to base of thread	...	...	...	...
5. Distance from face of nipple to start of second turn	¼	⅛	⅛	⅜
6. Coupling (internal thread) cylindrical to base of thread	...	...	...	...
7. Distance from face of coupling to start of second turn	¼	⅛	⅛	⅜
8. Depth of coupling from face to washer seat	1	1⅛	1⅛	1¼
9. Outer ends of external and internal thread should be terminated by the "Higbee Cut" on full thread to avoid crossing and mutilation of thread*	...	...	...	...
10. American (National) form of thread must be used	...	...	...	...

*Note—It is recommended that the diameter of the cutter not exceed ⅝ inches.

An important step has been taken in the recent approval by the American Engineering Standards Committee of American National screw threads for fire hose couplings, as reported in THE IRON AGE of June 26, page 1852. Approval of this standard which had been submitted under the leadership of the National Board of Fire Underwriters, the American Water Works Association, and the American Society of Mechanical Engineers, marks for the first time a national agreement on tolerances or limits of accuracy necessary to secure interchangeability in manufacture.

The approved standard is intended to cover the threaded part of fire hose couplings, hydrant outlets, stand-pipe connections, Siamese connections and all other special fittings on fire lines where fittings of 2½, 3, 3½ and 4½ in. nominal diameter are used. The characteristics of the standard thread are set forth in Table I. The approved standard also includes the limiting dimensions of the field inspection gages.

*Table II—Limiting Dimensions for Coupling Threads, Internal**

All dimensions given in inches

Nominal Size	No. of Threads Per. In.	Min. Major Diameter**	Pitch Diameter Max.	Pitch Diameter Min.	Minor Diameter Max.	Minor Diameter Min.
2.500	7.5	3.0836	3.0130	2.9970	2.9424	2.9104
3.000	6.0	3.6389	3.5486	3.5306	3.4583	3.4223
3.500	6.0	4.2639	4.1736	4.1556	4.0833	4.0473
4.500	4.0	5.7859	5.6485	5.6235	5.5111	5.4611

*Table III—Limiting Dimensions of Nipple Threads, External**

All dimensions given in inches

Nominal Size	No. of Threads per In.	Major Diameter Max.	Major Diameter Min.	Pitch Diameter Max.	Pitch Diameter Min.	Max. Minor Diameter***
2.500	7.5	3.0686	3.0366	2.9820	2.9660	2.8954
3.000	6.0	3.6239	3.5879	3.5156	3.4976	3.4073
3.500	6.0	4.2439	4.2079	4.1356	4.1176	4.0273
4.500	4.0	5.7609	5.7109	5.5985	5.5735	5.4361

Notes on Tables II and III

*The largest nipple is purposely made smaller in diameter than the smallest coupling in order to ensure a fit loose enough so that these threads can be assembled quickly regardless of the presence of dirt, burrs, bruises, etc.

**These dimensions correspond to the basic flat (⅛ p.). The profile at the major diameter of the coupling, produced by a worn tool, must not fall below the basic outline, but a new tool may be made with a flat at the point as small as 1/24 p.

***These dimensions are figured to the intersection of the worn tool arc with a centerline through crest and root. New tools may be made to give a minimum minor diameter of the nipple as small as that corresponding to a flat of 1/24 p.

A comparison of the limiting dimensions of couplings and nipple, respectively, is given in Tables II and III herewith. These dimensions are in harmony with the nominal dimensions originally specified by the National Fire Protection Association Committee, the National Board of Fire Underwriters, the American Society of Mechanical Engineers and the Bureau of Standards. In this table, however, they are expressed in a manner to assure absolute interchangeability of the product. It should be noted that they determine the size of the finished product and not of the threading tools.

The basic form of screw thread is the American (National) standard form, formerly known as the "United States Standard Form." This form of screw thread has an included angle of 60 deg. and is truncated top and bottom in accordance with the dimensions given in the tables herewith.

Table IV—Limiting Dimensions of Field Inspection Plug Screw Thread Gages for Couplings, Internal

All dimensions given in inches

Nominal Size	No. of Threads Per Inch	"Go" or Minimum Gage: Major Diam. Max.	"Go" or Minimum Gage: Major Diam. Min.	"Go" or Minimum Gage: Pitch Diam. Max.	"Go" or Minimum Gage: Pitch Diam. Min.	"Not Go" or Maximum Gage: Major Diam. Max.	"Not Go" or Maximum Gage: Major Diam. Min.	"Not Go" or Maximum Gage: Pitch Diam. Max.	"Not Go" or Maximum Gage: Pitch Diam. Min.
2.500	7.5	3.0846	3.0836	2.9980	2.9970	3.0836	3.0826	3.0130	3.0120
3.000	6.0	3.6399	3.6389	3.5316	3.5306	3.6389	3.6379	3.5486	3.5476
3.500	6.0	4.2649	4.2639	4.1566	4.1556	4.2639	4.2629	4.1736	4.1726
4.500	4.0	5.7869	5.7859	5.6245	5.6235	5.7859	5.7849	5.6485	5.6475

Notes: (a) The minor diameters of plug thread gages are undercut below the nominal minor diameter to give clearance for grinding or lapping.

(b) The allowable variation in lead between any two threads not farther apart than the length of engagement is ± 0.0005 in.

(c) The allowable variation in one-half angle of thread is ± 10 min.

(d) The diameters of the "Not Go" field inspection plain plug gages are the same as those given for the maximum minor diameter of couplings given in *Table II*.

Table V—Limiting Dimensions of Field Inspection Ring Screw Thread Gages for Coupling Nipple, External
All dimensoins given in inches

Nominal Size	No. of Threads Per Inch	"Go" or Maximum Gage — Pitch Diam. Max.	"Go" or Maximum Gage — Pitch Diam. Min.	"Go" or Maximum Gage — Minor Diam. Max.	"Go" or Maximum Gage — Minor Diam. Min.	"Not Go" or Minimum Gage — Pitch Diam. Max.	"Not Go" or Minimum Gage — Pitch Diam. Min.	"Not Go" or Minimum Gage — Minor Diam. Max.	"Not Go" or Minimum Gage — Minor Diam. Min.
2.500	7.5	2.9820	2.9810	2.9104	2.9094	2.9670	2.9660	2.9114	2.9104
3.000	6.0	3.5156	3.5146	3.4223	3.4213	3.4986	3.4976	3.4233	3.4223
3.500	6.0	4.1356	4.1346	4.0473	4.0463	4.1186	4.1176	4.0483	4.0473
4.500	4.0	5.5985	5.5975	5.4611	5.4601	5.5745	5.5735	5.4621	5.4611

Notes: (a) The major diameters of the ring thread gages are undercut beyond the nominal major diameters to give clearance for grinding or lapping.
(b) The allowable variation in lead between any two threads not farther apart than the length of engagement is ± 0.0005 in.
(c) The allowable variation in one-half angle of thread is ± 10 minutes.
(d) The diameters of the "Not Go" field inspection plain ring gages are the same as those given for the minimum major diameter of nipples given in *Table III*.

The American (National) standard fire-hose coupling screw thread will be inspected in the field by plug and ring gages made within the limiting dimensions specified in Tables IV and V. The manufacturer's gages should, therefore, be made an appreciable amount within the limiting dimensions of these field inspection gages, by whatever amount may be desired so as to allow for gage wear and to avoid, as far as possible, disagreements which might otherwise arise due to slight differences in the dimensions of the gages.

Each manufacturer of fire apparatus should provide himself with a set of four final inspection gages and two plain cylindrical gages. The thread gages consist of a "go" and "not go" plug-thread gage for the couplings (internal thread) and "go" and a not go" ring-thread gage for the nipples. A set of standard field inspection gages consists of six pieces, three to gage the coupling and three to gage the nipple. Both the manufacturers gages and the field inspection gages are manufactured by the Pratt & Whitney Co., Hartford, the Greenfield Tap & Die Corporation, Greenfield, Mass., the Taft-Peirce Mfg. Co., Woonsocket, R. I., the Wells Corporation, Greenfield, Mass., and the Sheffield Machine & Tool Co., Dayton, Ohio.

Cleans and Grades Carburizing Compound

The reclaiming of more compound than accomplished by the hand method, and also a large saving of labor in the process, are claimed for the carburizing compound cleaning and grading machine illustrated herewith, which has been placed on the market by the Brown Lynch Scott Co., Monmouth, Ill.

In operating the machine the pot used for case hardening is dumped, either hot or cold, into the hopper

The Machine Is Rated to Clean and Grade Carburizing Compound at Rate of 1000 to 1500 Lb. Per Hour

at the top. The hopper is agitated mechanically and the compound drops into the machine where it passes over two sieves that are mechanically shaken. This separates the remaining particles of scale, slag, clay and other foreign material, the cleaned and graded compound being delivered through the spout shown at the front of the machine. Dust is removed by connecting the machine with a suction fan system, or it may be permitted to settle in the bottom of the machine, from which it may be shoveled conveniently. In either case the dust is confined within the machine, which is inclosed in sheet steel and is practically dustproof. The hopper at the top of the machine serves to separate the treated steel parts from the compound when the pots are dumped in hot, the hopper with the steel parts then being rolled to the side of the machine and the steel dumped into a quenching vat. An adjustable feeding arrangement permits of varying the amount of compound fed to the shaker screens within the machine. A large door at the back of the machine permits of inspection or the convenient changing of screens. Screens with various sizes of perforation are available.

The capacity of the machine is approximately 1500 lb. per hr. The height is 5 ft., the width 4 ft. 3 in. and the length 4 ft. 8 in., overall. The shipping weight is approximately 900 lb.

In a ruling which it is believed closes the case, the United States Circuit Court of Appeals at Cincinnati has denied the application for rehearing made by counsel for the Italian Government in an action against the Wilkoff Co., Youngstown, for alleged breach of contract in a scrap metal transaction during the war. A jury in common pleas court gave the Italian Government damages in the amount of $157,600, which was subsequently reversed. The Wilkoff Co. is one of the largest scrap metal interests operating in the Youngstown district.

Changes and alterations to the property at Warren of the American Puddled Iron Corporation, Youngstown, Ohio, will be completed so that the plant may operate before the end of the year, provided business conditions warrant. Rolling mill machinery has been rearranged and the location of equipment changed to some extent. It was found that these changes were necessary, following initial operations. Inasmuch as this property is the only one of its kind in the country, much initial experimental work has been necessary.

The National Association of Farm Equipment Manufacturers will hold its annual convention at Congress Hotel, Chicago, Oct. 22, 23 and 24.

COMMEND STEEL CORPORATION

Opponents of Pittsburgh Plus Express Their Views in Regard to Changed Conditions

The action of the United States Steel Corporation in abandoning Pittsburgh Plus was approved at a meeting of the Executive Committee of the Associated States Opposing Pittsburgh Plus which was held at the Old Colony Club, Chicago, Oct. 11. This was the first meeting of the committee since the Steel Corporation, the respondent in the suit against the Pittsburgh plus practice before the Federal Trade Commission, filed its certificate of compliance with the order.

An official statement given out by B. F. Baker, vice-president Kewanee Boiler Co., Kewanee, Ill., and chairman of the committee, asserted that the Steel Corporation had complied in absolute good faith with the Federal Trade Commission's order abolishing the Pittsburgh plus practice. Prices on all the corporation's products, it stated, have been adjusted in accordance with the commission's order, or are in process of adjustment, at all points where the corporation has mills. At all these points independent steel producers have been compelled to meet the new price schedules of the corporation, which are materially lower than former quotations, and at such points consumers have reaped the benefit of lower cost steel. The corporation's mills, being mainly in Pittsburgh and west of Pittsburgh, have forced Western prices down, but in the East, it was asserted, where the independent producers control the market, there have been no material variations from the former Pittsburgh plus price schedules. The West, therefore, according to the committee's statement, has derived the advantage of the fight it has made upon this practice, while the East, which was not so active, is still paying the former high prices for steel to the controlling independent mills.

Members of the committee were emphatic is stating that the Steel Corporation has shown the utmost good faith in its compliance with the commission's order and in its responsiveness to public opinion in this case.

It was also determined by the committee that a joint report be submitted to the legislatures of Illinois, Wisconsin, Minnesota and Iowa, which States appropriated a total of $55,000 to combat the Pittsburgh plus practice, and that this report, which must be prepared and submitted to a meeting not later than Nov. 15, should also be submitted to the 28 additional States which participated in the campaign.

Those who attended the meeting of the committee included Chairman Baker, Herman L. Ekern, attorney general of Wisconsin; Senator Randolph Boyd and Representatives J. E. McMackin and Robert Scholes of the Illinois committee; H. G. Pickering, Superior, Wis., attorney for the Associated States; Don Montgomery, Madison, Wis., economic adviser, and W. E. McCollum, Chicago, assistant secretary.

Trade and Technical Topics to Be Discussed by Gear Makers

Several addresses on a variety of topics and progress reports of a large number of committees will be presented at the meeting of the American Gear Manufacturers' Association to be held at Briarcliff Lodge, Briarcliff Manor, N. Y., Oct. 16 to 18.

"New Gear Applications" will be the subject of an address by T. C. Roantree, Westinghouse Electric & Mfg. Co., East Pittsburgh, and a paper on "Shop Costs" will be presented by Thomas Haley, Fawcus Machine Co., Pittsburgh. The construction and application of spur gear speed reducers will be outlined in an address by Warren G. Jones, W. A. Jones Foundry & Machine Co., Chicago. "The Trend of the Transmission," is the title of an address to be delivered by W. A. McCarrell and Erik Oberg, editor *Machinery*, New York, will talk on the question of "How Are Our Future Mechanics to be Trained?" A speaker of national prominence will be heard at the opening of the second general session.

The chairmen of the various standardization and other committees and sub-committees will present reports, and, following the dinner, Oct. 17, there will be a technical standards meeting. At the latter, which is under the chairmanship of B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, separate tables will be provided for each of the several sub-committees, and discussion will be on the subject of standardization activities for the coming six months in particular, and for the future in general.

A golf tournament is scheduled for the afternoon of Oct. 17.

Southern Coal & Iron Corporation Buys New Properties

The Southern Coal & Iron Corporation, 1414 South Penn Square, Philadelphia, has taken ownership of the iron properties of the Rittenhouse Iron Co., Philadelphia, located between Bethlehem and Philadelphia. These properties adjoin the Thomas Iron Co.'s properties, also recently acquired. The Southern Coal & Iron Corporation will put both properties into operation in conjunction with its Greiss Mines, shipping low phosphorus iron ore to the Eastern Pennsylvania furnaces. Daniel E. Curran, who was formerly with the United States Steel Corporation, and is now president of the Coal & Iron Corporation, said that new equipment will be installed in the acquired plant.

Decreased Activity of Steel Plants Reflected in Rate of Coal Consumption

WASHINGTON, Oct. 14.—Reserves of coal at iron and steel plants on Sept. 1, 1924, showed an average supply of 42 days as against 33 days on Sept. 1, 1923, according to an inventory of coal stocks just completed by the Bureau of the Census, Department of Commerce, in cooperation with the United States Geological Survey, Department of the Interior.

Of the supply of coal at steel plants on Sept. 1, of this year, there was an average of 36 days' reserve of steam coal and 56 days' reserve of gas coal as against 28 days and 42 days respectively on Sept. 1 of last year. Reserves of coal at by-product plants on Sept. 1 of this year were identical with those on hand Sept. 1 of last year. At both periods the average supply was 30 days. Reserves of low volatile were 33 days, while those of high volatile coal were 29 days.

The report says:

"The greatly decreased activity at steel plants was reflected by a decrease of 39 per cent in the daily rate of consumption of coal from June 1 to Aug. 31, 1924, as compared with the rate in August, 1923. Consequently, although the actual tonnage held at such plants was 22 per cent less on Sept. 1 than it was the year before, it was sufficient to last 42 days, at the decreased rate of consumption, against a 33 days' supply on Sept. 1, 1923.

"The depression in the iron and steel industry was in turn reflected in the demand for by-product coke for metallurgical purposes, and the average daily consumption of coal at such plants declined to 26 per cent of that a year ago. In terms of tons, the by-product plants had a 23 per cent smaller reserve on Sept. 1, 1924, than on that day a year ago. In terms of days' supply, however, the stocks on the two dates were practically identical."

Gas and Electric Fixtures

Census Bureau figures for the 1923 census of manufactures show production from 350 establishments of $60,649,530 of gas and electric fixtures, compared with $42,889,905 from 308 establishments in 1921. The number of wage earners increased from 9419 of 12,315 and their wages from $11,060,076 to $15,654,181. The total value added by manufacture advanced from $24,102,165 to $34,683,650. The horsepower used in 1923 was 14,100 and the coal consumed amounted to 38,801 net tons.

Multiple System of Electric Melting

"Twin Furnace" Plan as Applied to a Steel Foundry —Greater Speed in Melting and Less Equipment Claimed

BY E. A. HANFF*

FROM the time when the electric furnace became a real factor in the production of steel and entered into active competition with furnaces employing cheaper fuels, the efforts of the furnace manufacturers and users have been applied to the problem of securing greater production by reducing the idle time between heats. This question has been an important one because of the relatively large investment required, the desirability of decrease in overhead per ton of iron or steel, and because of the possibility of earning a better power rate by operating on a higher "load factor."**

Considering the problem of the steel manufacturer or foundryman interested mainly in quantity production in a highly competitive market, reduction in the average time lost between heats will result in many advantages, such as:

1. Greater tonnage produced per month.
2. Lower cost of power per ton.
3. Lower labor cost per ton.
4. Maximum return from investment.
5. Closer approach to continuous operation.

The introduction of the multiple system of electric melting has aroused much interest among foundrymen. The following history of its development is offered with a view to explaining some of the features which have not been brought out in previous articles. It is expected that detailed operating costs and data will shortly be available which will further demonstrate the advantages of this system.

The earlier electric furnaces were employed in the manufacture of high-grade steels, such as tool and alloy steels, and were usually basic lined and equipped with comparatively low capacity transformers. From 4 to 8 hr. per heat was considered a satisfactory time for melting and refining, and the high price obtainable for the products justified the slow working furnace in this field. When the possibilities of the electric furnace as a practical production tool began to be realized, it was evident that faster heats were necessary when electric furnaces were applied to commercial foundry work. Such furnaces were acid lined, eliminating the long refining period. Arc voltages and transformer capacities were increased to permit more rapid power input, so that modern well proportioned and properly powered furnaces will melt a normal charge of steel in from 45 min. to 1 hr.

With the reduction in melting time, the time between heats required for teeming, repairing refractories and recharging, became an increasingly important factor. The types of electric furnaces most commonly used today, when charged by hand, require an average time of 25 to 45 min. from power off to power on. With a melting time of one hour or less, this loss of time is a serious problem. The curves in Fig. 1 clearly show the relative magnitudes of idle and productive time.

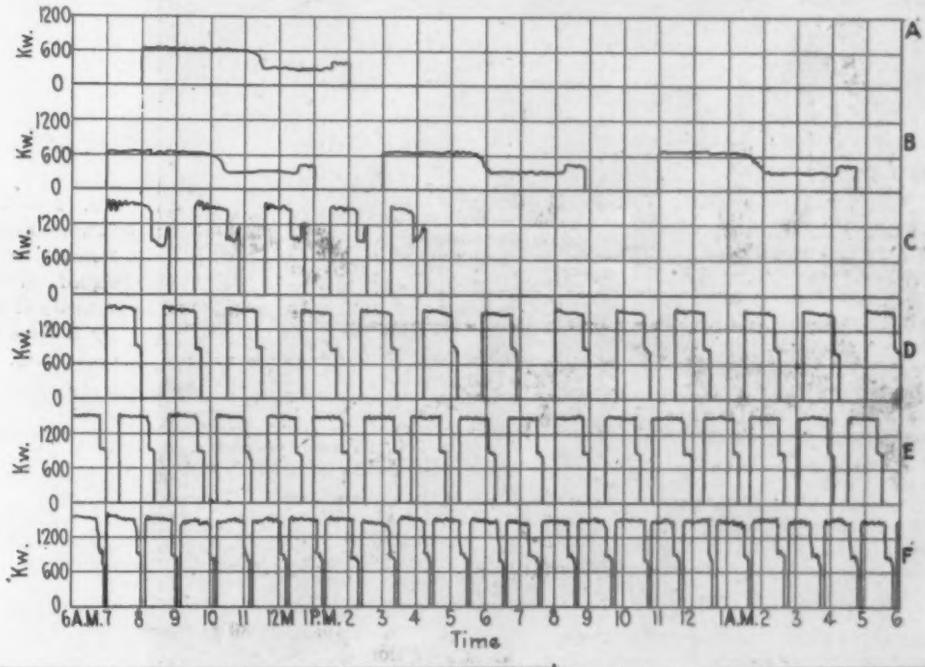


Fig. 1—Series of Curves Representing Typical Wattmeter Records for Electric Furnaces Operating Under Different Conditions

The efforts to reduce this lost time have been directed along two principal lines:

First, to reduce the time required for charging, by the use of mechanical charging devices.

Second, to use the electrical equipment on more than one furnace crucible, thus making the melting period practically continuous.

Various mechanical charging equipments have been employed. Some of these use a telescoping chute, adapted to "shoot" the charge from an elevated platform or bin into the charging door of the furnace. Various styles of boxes and buggies have been developed which are placed, fully loaded, adjacent to the furnace. As soon as the molten metal has been tapped and any necessary patching of furnace bottom has been taken care of, these boxes are lifted by means of a crane and the contents dumped into the furnace. Another scheme which has been successfully employed

*Electrical engineer, William Swindell & Brothers, Pittsburgh.

**See footnote on page 1003.

makes use of a mechanism which tilts the roof clear of the furnace, allowing the charge to be dropped in from a bottom discharge bucket operated from a crane.

These devices have materially shortened the actual time of charging and, theoretically at least, show a substantial saving of time. In practical operation, due to the time required for teeming, patching bottom, operating crane, etc., the average time between heats is seldom less than 20 min. Under exceptionally favorable conditions, instances have been reported where the time from power off to power on has been less, but the figure given is believed to be a fair average.

Fig. 1 shows a series of curves representing typical wattmeter records for electric furnaces operating under different conditions. Curves "A" and "B" represent the results obtained with the early low powered basic lined furnaces where one or two heats a day were considered satisfactory. Daily load factors of but 19.4 per cent for 10 hr. operation and 57 per cent for 24-hr. operation, together with high kilowatt hour consumption per ton of steel were unavoidable on this basis of operation.

Curves C and D show the improvement made due to acid operation and the use of larger transformer capacity. On 24-hr. operation, it is possible to make 13 or more heats per day (load factor of 59.5 per cent). Mechanical charging devices permit a further reduction of time between heats as indicated by curve E and a corresponding improvement in daily load factor.

Mechanical charging devices have reached a fairly high degree of development, but even with the best operation, it is impossible to eliminate the time required for teeming and patching. The use of the charging equipment generally requires a second crane and its operator, and the attention of one or two other men is required to manipulate the furnace and charging mechanism. There is therefore an unavoidable loss of time between heats and in order to keep this time at a minimum, the men must work at top speed during this period. During the melting period, these men may be idle or must be assigned to other tasks.

In attacking the problem from another angle, it was believed that more time could be saved, and with less labor, by employing more than one crucible, so that a single electrical system could be applied first to one furnace and then to a second as soon as the charge in the first furnace was melted. In this way the process would become nearly continuous, the only time lost being that required to change the power from one furnace to another.

While the first consideration of this problem dates back to a considerable extent, it was not until 1918 that the various schemes were given proper designing and operating consideration. The first and perhaps most obvious scheme was to use two complete furnaces with a single transformer and a double throw switch to change the connection from one furnace to the other. Since this involved two complete sets of electrodes and their hoisting mechanisms and required two separate charging and teeming positions, it was felt that it offered very little advantage over two distinct furnace installations, either from an operating or investment standpoint.

As the next step in the development, the use of two furnaces with a single electrode system, arranged to serve either furnace, was considered. This made use of a pivoted electrode supporting structure which could be swung from one furnace to the other. This idea was discarded as impractical, since it also required two charging and pouring positions and involved a complicated and unsatisfactory method of handling the electrode and flexible cable systems.

As a modification of this last scheme, it was also proposed to transfer the furnace roof as well as the electrodes from one furnace to the other, using an auxiliary cover over the idle furnace. It was decided that such a construction would prove troublesome in practice and result in considerable loss of heat during the time the roof was being transferred.

From a further study of the preceding schemes and several modifications, it became evident that any manipulation of the electrode system or use of high current double throw switches would not make a satisfactory or practical job for commercial work. Attention was then directed toward moving the furnace crucible rather than the electrical system. A scheme was worked out in which the furnace crucible could be lifted off its melting position by means of a crane and used as

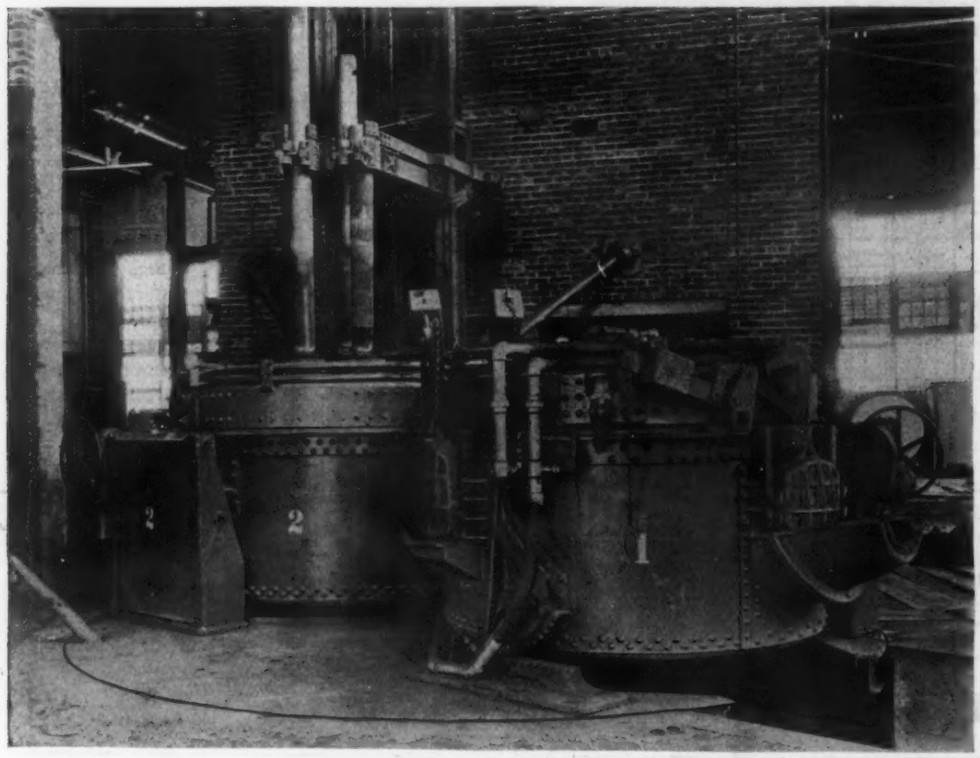


Fig. 2 — The "Twin" Electric Furnace as Installed in the Foundry of Kelley & Jones Co., Greensburg, Pa.

Fig. 3 — The "Twin" Furnaces Are Located at the End of the Steel Foundry and Operate on a Turntable

a ladle to pour the metal directly into the molds. A second furnace, previously charged with scrap, would then be placed in position for melting. This scheme, while quite practical for very small sizes of furnaces, is not feasible for commercial sized units required by modern steel foundries.

In the next scheme proposed the furnace bodies were mounted on movable trucks placed on a straight track. In this plan, one furnace is under the electrodes and the charge is being melted, while the other furnace is at the right being charged. When the charge in the first is completely melted, both furnaces are moved to

Fig. 4 — While One Furnace Is Being Emptied, the Other Is Under Power

the left, bringing the second under the electrodes and the other to its pouring position. On the next heat, both furnaces are moved to the right. This scheme appeared to offer a thoroughly practical unit, but due to the floor space required and the necessity for two separate charging and pouring positions, it was not looked upon as an ideal solution.

To offset the disadvantages pointed out above, the use of a circular track was suggested, from which was developed the use of a turntable carrying two furnaces, 180 deg. apart. This arrangement was first developed for a "nose-tilt" type of furnace. The use of the turntable carrying the two furnace bodies retains the advantages of the other schemes considered and, in addition, requires only one charging and pouring position.

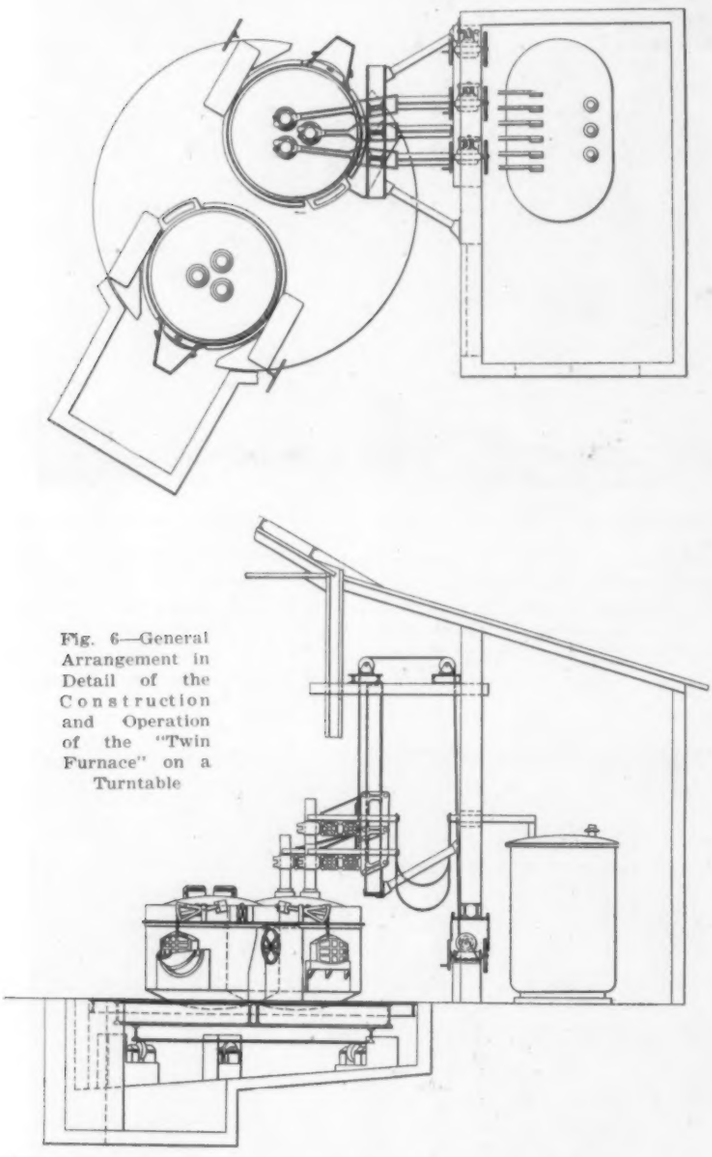


Fig. 6—General Arrangement in Detail of the Construction and Operation of the "Twin Furnace" on a Turntable

Figs. 2, 3 and 4 are photographs of a commercial installation of these furnaces in the Kelly & Jones Co.'s plant at Greensburg, Pa. Due to business conditions, no opportunity has been afforded to determine the maximum limits of operation, but in ease of handling, efficiency and saving of time between heats, the installation has more than fulfilled the expectations of the designers. The use of two furnaces on a turntable has been designated as the multiple system of electric melting as distinguished from the customary "single" furnace.

Figure 5 shows a photographic reproduction of a graphic wattmeter chart taken from an ordinary night's run from the above furnace. This shows several successive heats with an average time of approximately 3½ min. from "power off" to "power on."

In regular operation, the shortest time noted between heats has been 2 min. 5 sec. Curve F, Figure 1, shows the possibilities in the way of improved production and load factor with the multiple furnace. Allowing an average of 4 min. between heats, it is possible to make 22 heats in 24 hr. with a load factor of 95.8 per cent. Other installations of this type are now being installed in commercial foundries.

A brief description of the design features of this furnace may be of interest. The turntable is constructed of structural steel and steel castings. Two girders, extending clear across the table, carry the track stands of the two furnaces. The girders are fabricated to a circle carrying a machined tread which rests on six Timken roller bearing rollers mounted on the foundation. Two pairs of these rollers are directly under the rocker stands of the furnace, so that in operating position the entire load is supported in a direct line from the foundation. The entire foundation beneath the furnaces is clear of mechanism and slopes toward the pouring pit. At the center of the turntable, there is a ball bearing which carries very little weight but keeps the table properly centered. With the smaller furnaces, the turntable with both furnaces completely loaded can be rotated by one man. The larger capacities are equipped with motor drive. In order that the two furnace bodies will always be stopped directly under the electrodes, a special locking device is mounted in the floor near the tilting position. This lock positively engages in a pocket in the turntable at the exact point where the furnace is directly under the electrodes.

A new type of tilting gear has been developed and forms a compact unit at one side of the furnace shell. The furnace is equipped with two large radius rocker castings which roll on machined tracks fastened to the turntable. The design completely prevents the possibility of overturning the furnace.

The furnace roof rings are equipped with a new type of clamping lug which permits adjustment horizontally to line up the eyes with the electrodes. Changing a roof is a simple matter on this furnace, since the roof can be taken off when the furnace is out of the way of the electrodes.

The door arches and roof skewbacks are water cooled by means of a continuous water-cooling ring. The furnaces are equipped with a new type of water-cooled economizer. This economizer is provided with ribs to cool the gases and has an upper chamber fitting closely around the electrode and providing a constantly increasing area for the escaping gases which are directed to the outside of the top chamber. The gases are thus prevented from blowing through around the electrode and are so effectively cooled that very little flame appears during operation. The circulating water is brought up through a swivel joint placed at the center of the turntable and discharges into a funnel which surrounds the feed pipe.

The electrode system presents several features of interest. The electrode carriers travel on machined masts which are supported from the framework of the building. The hoisting winches are mounted in an opening in the wall of the transformer room and are protected by removable covers.

The electrode holders are of novel design and operate without any water cooling, thus eliminating much trouble and inconvenience. Proper design and ample

contact area has solved this old-time trouble. High conductivity copper carries the current only, while all mechanical stresses required for proper contact are taken care of by steel. The hinges do not carry any current. The holders are tightened by means of a wedge, so that the operator on a hot furnace need only use a hammer to adjust electrodes. A novel non-slip electrode device is a feature on the furnaces.

After a charge has been melted in the furnace, the electrodes are withdrawn completely from the furnace. The winches are operated at about three times normal speed at the time of withdrawal, permitting a quick shift from one furnace to the other. Since the electrodes and cables are never required to tilt, they are not subject to breakage from this cause which, in most furnaces, imposes a severe strain upon the nipple joints. As the motion is limited to a vertical travel, the flexible leads are comparatively short. These leads are made of laminations of thin copper arranged in several packs with an air space between, thus obtaining maximum cooling effect and reduction of losses due to "skin effect" or the tendency of heavy currents to flow only in the outer area of the conductor. Since the form of the conductors is flat, they can be readily clamped between bus bars and perfect joints are thereby insured.

Repairs to the lining of one furnace or replacing

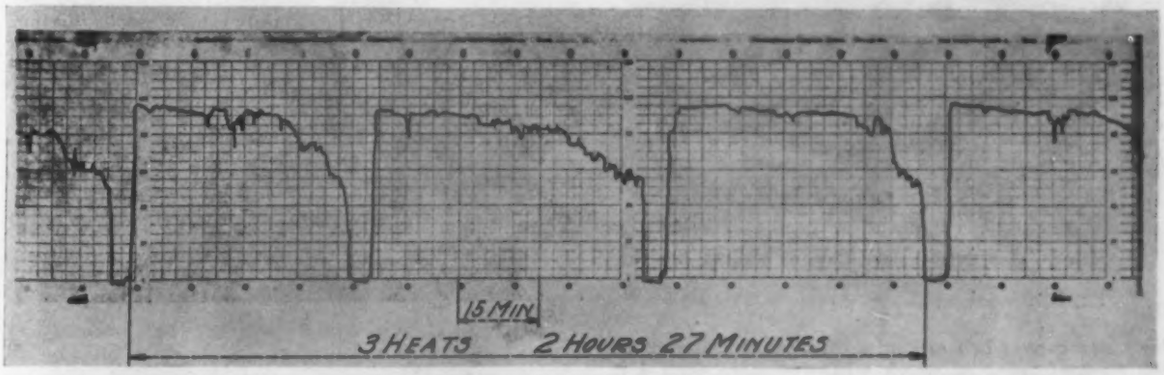


Fig. 5—Photographic Reproduction of a Graphic Wattmeter Chart Taken From An Ordinary Night's Run on the Twin Furnaces

of a roof can be carried out without holding up production, as the second body is always available during this time.

The general arrangement of the multiple furnace installation is shown in Fig. 6. The space required is only slightly greater than for a single furnace and considerably less than that required for two independent furnaces.

The multiple melting system was developed by William Swindell & Brothers, Pittsburgh. Its operation has demonstrated that it is thoroughly practical and it makes possible economies and advantages to the large production foundry. Some of the features which are of special importance may be mentioned:

(1) Lower power costs due to improved load factor as demonstrated in Fig. 1.

(2) Larger output of steel per dollar invested due to more and faster heats per day.

(3) Reduced labor costs per ton of steel.

(4) Closer approach to continuous operation, with its many benefits.

(5) Lower costs per ton of steel resultant from economies under paragraphs 1, 2, 3 and 4.

(6) Scrap may be pre-heated with oil or gas in the second furnace while melting in the first furnace, resulting in lower power consumption.

(7) Reduced electrode consumption due to elimination of breakage.

(8) Elimination of shut-downs when changing roof or relining. While one furnace is being relined, operation can continue on the other.

**While the term "load factor" is quite generally understood, it may be well to define it again in its application to electric furnace power supply. The load factor of any power consuming equipment expresses the ratio of the quantity of power actually used in a given time (day, month or year) to the total which might be used with the equipment taking full load power continuously throughout the period. Practically all the modern power rate schedules are constructed to give the consumer benefits in the way of lower rates as his load factor increases and to penalize him by charging proportionately higher rates when the equipment is allowed to be idle for a greater part of the time. In electric furnace plants operating 24 hr. a day, monthly load factors as high as 85 per cent may be obtainable, but ordinarily do not exceed 60 per cent. Under 8 or 10-hr. day operation, the monthly load factor will seldom be better than 35 per cent and is often 10 per cent or lower.

Exports and Imports of Metallic Products

Reports of the Department of Commerce show that the exports of ores, metals and manufactures of metals, excluding machinery and vehicles, during the first eight months of 1924 amounted to $293,141,791, compared with $269,016,071 in eight months last year. More than half the amount was of iron and steel, the figures being $154,310,927 this year and $151,749,315 last year. Copper and manufactures accounted for $100,537,381 in 1924 and $84,215,841 last year.

Machinery and vehicles exported in eight months of 1924 amounted to $372,370,697, compared with $317,327,509 in 1923. Of these amounts $216,188,635 in 1924 and $188,909,876 in 1923 were machinery, while vehicles provided $156,182,062 in 1924 and $128,417,633 in 1923.

Imports of ores and metals and metal manufactures, excluding machinery and vehicles, aggregated $195,006,387 in eight months of 1924, against $202,991,194 in 1923. Of this amount iron and steel gave $19,653,236 in 1924 and $23,419,783 in 1923. Copper aggregated $65,581,380 in 1924 and $66,256,562 in 1923. Tin bars, blocks, pigs, etc., amounted to $47,807,533 in 1924 and $42,566,283 in 1923. Machinery and vehicles accounted for $11,196,360 in 1924 and $14,082,186 in 1923.

Cutlery and Edge Tools

Census Bureau reports from 211 establishments show production of cutlery and edge tools in 1923 valued at $72,477,013, compared with $49,341,204 from 210 establishments in 1921. The number of wage earners increased from 14,345 to 16,671, and their wages from $14,749,993 to $19,750,833. The value added by manufacture increased from $34,367,237 to $55,317,188. The horsepower used in 1923 was 43,196, while the coal consumed was 89,058 net tons.

In 1923, Massachusetts had 42 of the establishments, followed by 36 in New York, 25 in Connecticut, 24 in Pennsylvania, 23 in New Jersey and the remainder scattered in 18 other states.

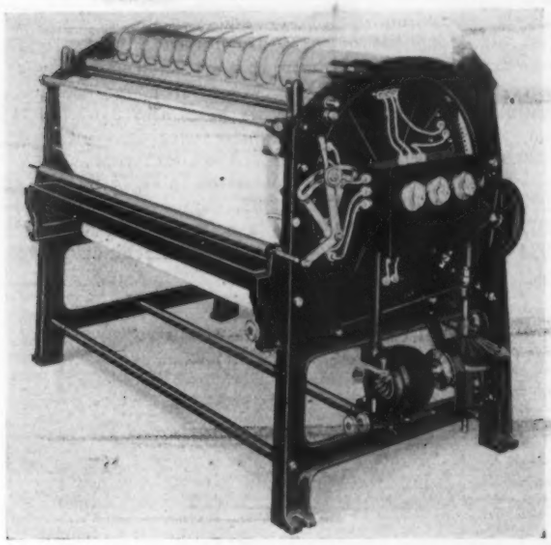
The Youngstown Sheet & Tube Co., Youngstown, has awarded to the William B. Pollock Co., Youngstown, a contract to rebuild and enlarge its Jeannette blast furnace in the Brier Hill group.

Equipment for Drying Blueprints

The drying of blueprints at a speed ranging from 8 to 14 lineal ft. per min. is claimed for the machine shown in the accompanying illustration, which has been placed on the market by the Paragon Machine Co., Rochester, N. Y.

This machine, which is intended also for drying photostats, is available in 42-in. and 54-in. sizes, the latter being said to be capable of drying 2000 sq. ft. per hr., when being operated at maximum capacity. Either gas or electricity may be employed as the source of heat.

The drying process is continuous and the paper follows on a canvas belt around a cylindrical heated drum, the circumference of which measures more than 6 ft. The contact surface engaged by the wet print in one revolution of the 54-in. machine is more than 25 sq. ft., and more than 20 sq. ft. in the 42-in. machine. Because of the unusual speed and capacity, it is claimed that the prints are dried without excessive heat.



Blue Prints Are Dried at the Rate of 8 to 14 Lineal Ft. Per Min.

The prints are delivered at the back of the machine out of the operator's way and which is convenient for trimming. They are ironed smooth and flat as well as being dried.

Production of Motor Vehicles in 1923

Census Bureau figures show a production in automobile plants in 1923 of 3,472,420 passenger vehicles driven by gasoline or steam and valued at $2,277,800,046, or an average of $656 each. In addition, 12,878 public conveyances were produced, valued at $24,667,251, or an average of $1,916 each; 1192 Government and municipal vehicles, valued at $10,051,776, or an average of $8,432; 402,408 business vehicles, valued at $295,868,451, or an average of $735 each; 1236 electric vehicles valued at $3,059,906, or an average of $2,476 each, and 11,191 trailers, valued at $4,233,069, or an average of $378 each. Other products, including spare parts, amounted to $547,647,375, making a total output of $3,163,327,874 or an increase of 89.3 per cent over the $1,671,386,976 of 1921. All values are f.o.b. factory.

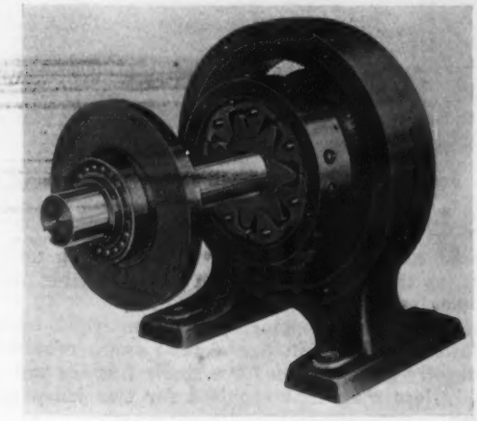
Returns covered 351 plants in 1923 and 385 plants in 1921. The average number of wage earners increased 68 per cent from 143,658 in 1921 to 241,356 in 1923. Their wages increased from $221,973,586 to $406,730,278, while the average wages per wage earner went up from $1,545 to $1,685. Passenger vehicles valued at not more than $500 each numbered 1,727,958, or about half of the total. Cars valued between $500 and $800 numbered 814,090, or nearly half of the remainder; cars valued between $800 and $1,500 numbered 664,189, while only 42,240 cars were valued above $2,500. Thus almost 94 per cent of the total output were in the class from $1,500 downward. About 70 per cent of the motor trucks and other business vehicles were in the group for 1 to 1½ tons, there being 282,386 of these sizes. More than half the remainder were below 1 ton, the number being 75,173. Only 15,650, or less than 4 per cent of the total, were of more than 3 tons capacity.

Speed-Reducing Device

A speed-reducing device recently placed on the market by the Meachem Gear Corporation, Syracuse, N. Y., for use with high-speed turbines and motors is shown in the accompanying illustration.

In this device the load is transmitted from the high speed shaft through planetary gears to a slower rotating annular ring. Inside this ring are connected a number of rockers which engage with a spider keyed to the low-speed shaft. As the driving motor or turbine starts up, each of the rockers engaging with the teeth of the spider first compresses a spring plunger, which brings the bottom of the rocker into positive contact with the inside of the annular ring and at the same time brings its side into positive contact with the side of the adjacent spider tooth. It is claimed that during the time required to compress the spring plungers, corresponding to about one quarter of a revolution, there is practically no load on the turbine or motor, and the load is then transmitted gradually and without starting shock. The spring plungers are intended also to serve to eliminate vibration and backlash, thereby assisting quiet operation.

The low-speed shaft to which the spider is keyed is supported on both sides of the spider. The pinion on the high-speed shaft is permitted to float and adjust itself to the proper position between the planetary gears, thus preventing side strains or unequal stresses.



Speed Reducer With Low-Speed End Housing Removed Showing Flexible Connection

The speed reducer is entirely inclosed, providing dust-proof and fool-proof construction, and rotating parts run in oil, with forced lubrication above 1800 r.p.m. The device may be applied either to step-up or step-down speed change, and is available in ratios from 4 to 1 to 200 to 1 and for loads up to 500 hp.

H. M. Lane, president H. M. Lane Co., Detroit, engineers, was the guest of the New England Foundrymen's Association at its October meeting held Oct. 8 at the Exchange Club, Boston. Mr. Lane gave an excellent idea of European foundry practices and conditions, comparing them with conditions on this side of the water, dealing with fundamental differences, particularly as regards types of machinery used abroad. Casting problems, as he found them on inspection abroad, were admirably presented at the meeting, which was well attended. Norman Russell, president of the association, presided at the meeting.

Department of Commerce and Business

Cooperation of Department with American Exporters and Other Business Interests Has Been Growing Steadily for Many Months

ONE of the things which have had prominent attention in connection with the meetings of business paper editors with Herbert Hoover, Secretary of Commerce, is the relation of the Department of Commerce to business. At the Sept. 22 meeting in Washington it was decided that a summary of the methods by which the department has helped business might well be made so that the situation could be visualized and the changes which have been wrought in the past three years subjected to survey. Only in the most cursory way can this be covered here, but some of the high spots of the achievements of Mr. Hoover's department are touched on in the following paragraphs:

Helping American Exporters to Find Business

Particularly suggestive has been the reconstruction of the work of the Bureau of Foreign and Domestic Commerce. This bureau has been expanded on the basis of expert specialized attention to specific groups of commodities, in place of the purely geographical and technical basis which formerly obtained. New activities of all sorts have been undertaken and the 16 commodity divisions created have permitted close cooperation between the bureau, the trade associations and other business interests.

One measure of the benefit which this change has brought about was had from the results of a recent questionnaire, in which some 16,000 exporting houses were asked whether they had been able to trace increased business to the bureau's efforts and to what extent. There were about 6000 replies, of which 3700 showed definite returns. From these returns it has been estimated that the new business secured through the service of the bureau in the fiscal year 1923-24 was over $529,000,000. The cost of operation of the bureau at $2,600,000 was less than ½ per cent of this.

Commercial intelligence, particularly as regards foreign buyers of specific products, has been expanded heavily. This covers also the question of credits and the failures of business houses all over the world. About 360,000 names of potential foreign purchasers of American goods are now on file. The growing demand for such concrete and valuable information is indicated by the fact that 417,200 requests for lists of these names were made in the fiscal year ended June 30 last, against only 71,900 such requests in the fiscal year ended June 30, 1922.

Working with American Manufacturers

Similarly the 16 district offices or service stations throughout the United States in 1921 has been expanded to 43. The inquiries handled through these stations per week have increased from 5700 in 1921 to more than 34,000 in 1924. These offices are continually furnishing information, as requested, to manufacturers and other business houses in their districts, and thus promoting the profitable exchange of commodities.

Concrete results of the work of the division of simplified practice have been given frequently in the columns of THE IRON AGE. Commodity after commodity has been studied—always at the request of the industry—and recommendations have been made for eliminating needless duplication or multiplication of sizes, styles, patterns, etc. In instance after instance the number of different sizes, etc., necessary to be carried has been reduced by from 50 to 90 per cent or more, with resulting saving in manufacturing and distribution expense and consequent economic benefit to the country.

Providing Industry Regularly with Statistical Data in Great Volume

Along with the accumulation of data in the department has come the publication of a monthly statistical review entitled *Survey of Current Business*. Started in a small way by collecting the more important and most easily accessible figures of business activities, this has grown steadily until now almost 1500 different business movements are portrayed each month through statistical tables, charts and reading matter. Collection of these figures has entailed a vast amount of work at the department, much of the material coming from individual concerns in the different industries affected. New lines of attack frequently have come up and new sets of data thereby have been made available.

In the most natural way, credit for the results achieved necessarily will be extended primarily to Mr. Hoover. In no small measure, however, must credit be accorded also to the staff of specialized assistants whom he has been enabled to gather around him, as heads of the different bureaus and of the commodity divisions already mentioned. It is largely to the expert service of these men that the carrying out of Mr. Hoover's ideas has been entrusted and the results speak for themselves.

Automobile Production in September

Preliminary figures gathered by the National Automobile Chamber of Commerce indicate that the September production of automobiles and trucks was not far from 274,300, making a total for the nine months to date of 2,814,480 vehicles. This is larger than the figure for any 12 months on record, with the sole exception of 1923. It exceeds the record-breaking 12 months of 1922, when 2,586,445 vehicles were produced. The figure for the nine months may be compared with the nine months record of last year, when the total was 3,032,083—the highest ever reached.

There has been a progressive falling off, quarter by quarter, this year. The first quarter showed 1,066,279; the second quarter, 931,883; the third quarter, 816,318. With the exception of the second quarter of 1923, which showed 1,155,551, the first quarter of 1924 was the highest ever recorded.

Shipments of pig iron from Middlesborough, England, by months from August, 1922, to August, 1924, inclusive, are shown in a circular issued by William Jacks & Co., Winchester House, London. Figures are segregated according to coastwise and foreign shipments, the aggregate for August, 1924, having been 29,965 gross tons. Except for February, this is the lowest figure for the eight months of the year. With the further exception of June and December of last year, it is the lowest figure shown in the 25 months covered. The total shipments for the eight months of the year aggregated 302,903 tons in 1924—a figure which, with the exception of 1921 and 1919, is much the lowest of the past 15 years. More than four times this amount was shipped in each of the years 1911, 1912 and 1913.

ENGINEERS IN ALABAMA

Mining Institute Discusses Papers and Visits Plants About Birmingham

BIRMINGHAM, ALA., Oct. 14.—With much enthusiasm the 130th meeting of the American Institute of Mining and Metallurgical Engineers opened at the Tutwiler Hotel, Monday morning. The greater number of the members attending came to Birmingham on the special train which left New York, Oct. 7, making stops en route at industrial points, including the Mascot mine of the American Zinc Co. near Knoxville, Tenn., and the plants of the Tennessee Copper Co., and the Ducktown Copper, Sulphur & Iron Co., at Copperhill and Ducktown in the extreme southeastern corner of Tennessee. The party spent Sunday in visiting the national parks in the vicinity of Chattanooga.

The Birmingham members of the institute, mainly executives of the large corporations of the district, together with the Alabama Mining Institute, composed of the coal operators of the State, gave the visitors a hearty reception. The technical sessions were held Monday morning, afternoon and evening in the ball room of the Tutwiler Hotel. George Gordon Crawford, president of the Tennessee Coal, Iron & Railroad Co., who made the address of welcome, was chairman of the first session; Frank H. Crockard, president of the Woodward Iron Co., presided at the afternoon session, and Truman H. Aldrich, a well known engineer, at the evening session. The technical papers on the program, relating largely to coal mining, coke making and blast furnace and steel works practice in the Birmingham district were interestingly discussed. The standing committees and the boards of the institute held their meetings, with William Kelly, president of the institute, in the chair.

Today and tomorrow are given over to excursions into the industrial district of which Birmingham is the hub. The close proximity of iron ore and coal and limestone will be emphasized in the trip by special train, which will take in also blast furnaces, steel plants, cast iron pipe works, by-product coke ovens and cement works. The changes in the industrial communities at Ensley, Fairfield and the other metallurgical centers in this district, produced by the large outlays of the Steel Corporation and the leading independent producers, are the subject of much comment from visitors, who had not been in Birmingham in the past decade.

The entertainment program includes a concert tonight and a dinner and dance at the Country Club, Wednesday night. The members of the institute were presented with booklets by the Alabama Mining Institute and the Tennessee Coal, Iron & Railroad Co., giving a full description of Birmingham and the Birmingham district, steel making in the South, and the progress in the development of other industries. The booklets were quite unusual both in text and illustration.

The train of the visiting party is scheduled to leave for Muscle Shoals at 2 a.m. Thursday, and will arrive at Washington at 3 p.m., Friday, Oct. 17.

MARKING TIME

New Tonnage at Youngstown Mills Maintains Operating Rate

YOUNGSTOWN. Oct. 14.—Although iron and steel makers in this district regard the steel industry as marking time, nevertheless new tonnage is coming to the mills in sufficient volume to maintain the improved operating rate of recent weeks. The improved conditions are best measured by the number of active blast furnaces. In the Mahoning and Shenango Valleys 20 stacks are now melting as compared with but 12 during the low point of the industrial depression in July. The active furnaces include the larger and more modern stacks, and the list this week shows a loss of one furnace, due to the blowing out of the merchant stack at Leetonia, 20 miles south of Youngstown, of the United Iron & Steel Co.

The active blast furnaces in the two Valleys include eight of 15 of the Carnegie Steel Co.; five of nine by the Youngstown Sheet & Tube Co., two of seven by the Republic Iron and Steel Co.; and one each by the Trumbull Steel Co. and the Sharon Steel Hoop Co. All of these are operated by steel-making interests. In addition, there are three merchant stacks active, all at Sharpsville, in the Shenango Valley, one each by the Shenango Furnace Co., the Sharpsville Furnace Co. and the Reliance Coke & Iron Co.

The A. M. Byers Co., Pittsburgh wrought iron producer, plans to blow in about Oct. 25 its rebuilt blast furnace at Girard. The Sheet & Tube company has a stack in its East Youngstown group ready for action as soon as business conditions warrant; the Carnegie Steel Co. one at Farrell, Pa., and the Struthers Furnace Co. its merchant stack at Struthers in Mahoning county.

Steel making continues with little variation from week to week, with 28 or 29 of 52 independent open-hearth furnaces melting, 22 of 30 Corporation open hearths active, and all four Bessemer plants in commission, with a varying rate of output.

Sheet mill schedules this week show a loss of one mill, with 79 units scheduled. Plate mill output is increased by the resumption of the unit operated by the Republic Iron & Steel Co. The Sheet & Tube company has but six pipe mills scheduled, one less than the preceding week. Independent tin mill schedules show a moderate loss from previous weeks, but the American Sheet & Tin Plate Co. has increased its tin plate output in Western Pennsylvania.

Of the non-integrated sheet rollers, the Newton Steel Co. is operating 10 of 20 mills, and the Falcon Steel Co., Mahoning Valley Steel Co. and Thomas Sheet Steel Co. six mills each. For the second successive week, the plant of the Waddell Steel Co. is idle.

The principal fabricating interests in the district are maintaining operations at 85 to 90 per cent.

Diesel Electric Locomotives

A paper-bound book of 186 pages, with 269 illustrations and printed in German, has been issued by the Verein deutscher Ingenieure, Berlin, dealing with Diesel electric locomotives. It was written by Prof. G. Lomonossoff in Russian and translated from Russian into German by Dr. Erich Mrongovius. Passing over the early developments of the steam locomotive, about a century ago, the first electric locomotive shown, with heat engine on the same body, is the Daimler of 1891. Successive developments since that time have brought the machine to its present stage of perfection, a large number of illustrations being given of intermediate types described. Starting with the Diesel developments, the subject is covered thoroughly, with a multiplicity of curves and other diagrams and records of tests, together with drawings of the apparatus and half-tones from photographs. The price is 20 (gold) marks.

Portland Cement Maintains High Record

September returns of the United States Geological Survey show production of Portland cement to have been 14,519,000 bbl., the largest figure, except for August's 15,128,000 bbl., of any month in the history of the industry. July, with 14,029,000 bbl., was the first month to pass the 14,000,000 mark. For nine months production has been 110,463,000 bbl., a gain of 9 per cent over last year's 101,427,000 bbl. (itself a new high record) for the same period.

Shipments in September, at 16,827,000 bbl., fell barely short of August's 16,855,000 bbl., the highest on record. July, with 16,614,000 bbl., was the first month to pass 16,000,000. For nine months shipments have reached 112,792,000 bbl., compared with 104,943,000 bbl. last year, the gain being 7½ per cent.

European Prices Crumbling Rapidly

English Pig Iron Weak and Finished Steel Lower—Continent Depressed—Belgian Temporary Improvement Has Vanished

(*By Cable*)

LONDON, ENGLAND, Oct. 14.

CLEVELAND pig iron is quiet but steadier. There is little likelihood of a revival before the general election, though there is a slightly better sentiment about. Makers of foundry grades are not inclined to press sales.

Hematite still is easy. It may decline further, owing to the existence of substantial stocks. Foreign ore is lifeless. The best Bilbao Rubio is quoted at 21s. ($4.72) c.i.f. Tees (nominal).

Finished steel position continues mediocre. English prices of plates, sheets, angles, tees, channels, joists, round bars and flat bars have been reduced 2s. 6d. (56c., equivalent to 0.025c. per lb.) for export. Scottish prices of ship plates and boiler plates have been reduced 10s. ($2.25, or 0.10c. per lb.), but the light-gage makers are busy.

In Scotland 29 blast furnaces are blowing: 17 on foundry iron, 11 on hematite and one on basic iron.

September exports of pig iron from the British Isles amounted to 26,094 tons, of which only 75 tons went to the United States. The total outward shipments of finished iron and steel amounted to 263,808 tons.

Sheets and Tin Plate

Rather more inquiry has developed for tin plate but business has not yet broadened appreciably. Some works are booked with orders at schedule figures. Wasters are being absorbed without difficulty. The Weirton Tin Plate Co. [Weirton Steel Co.?] has sold 20,000 boxes of tin plate wasters to the United Kingdom.

Galvanized sheets lack backbone, in the absence of serious export demand.

Black sheets also are easier, some makers running on short orders and talking of closing their mills, failing improvement.

On the Continent of Europe

Continental markets are rather easier. Prices have crumbled further. Merchant bars are being done at £5 12s. 6d. (1.13c. per lb.). Consumers are awaiting definite assurance that prices are going no lower. Makers are waiting for the outcome of pending commercial negotiations between Germany and France, Belgium and Luxemburg.

British Attitude More Hopeful, Though Much Pessimism Still Is Evident—Prices Most Unsatisfactory

LONDON, ENGLAND, Oct. 2.—While there are one or two bright spots in this industry in this country, the position as a whole is distinctly unsatisfactory. There seems to be almost, as it were, a strike of buyers, particularly in the overseas departments, and for this state of affairs various reasons have been assigned the chief one being the uncertainty caused by the whole political situation of Europe in general, and more especially of the Continent. There is a feeling that, until the Dawes report is put into actual operation, little revival can be expected. Whether it will be so or not remains to be seen, but certainly the normal autumnal business is very late in coming in.

While there is an outcry in many quarters that Continental competition is the chief stumbling block, and this may be true in certain specifications, the position on that side certainly does not seem bright, as works are wanting orders and prices continue to tumble without attracting business. Doubtless if prices could show

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British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.50 per £1, as follows:

Durham coke, del'd	£1	5s.				$5.62			
Bilbao Rubio ore†	1	4				5.40			
Cleveland No. 1 fdy	4	5				19.12			
Cleveland No. 3 fdy	4	0				18.00			
Cleveland No. 4 fdy	3	19				17.77			
Cleveland No. 4 forge	3	18				17.55			
Cleveland basic	4	0				18.00			
East Coast mixed	4	8	to £4	8½s.		19.80	to	$20.02	
East Coast hematite	4	19	to 5	0		22.27	to	22.50	
(a) Ferromanganese	13	10	and 13	0*		60.75	and	58.50*	
Rails, 60 lb. and up	9	10	to 9	15		42.75	to	43.87	
Billets	7	10	to 8	5		33.75	to	37.12	
Sheet and tin plate bars, Welsh	8	12½				38.81			
Tin plates, base box	1	3½				5.29			
						C. per Lb.			
Ship plates	9	2½	to 9	12½		1.83	to	1.93	
Boiler plates	13	0	to 13	10		2.61	to	2.71	
Tees	9	2½	to 9	12½		1.83	to	1.93	
Channels	8	7½	to 8	17½		1.68	to	1.78	
Beams	8	2½	to 8	12½		1.63	to	1.73	
Round bars, ¾ to 3 in.	9	7½	to 9	17½		1.88	to	1.98	
Galv. sheets, 24 gage	17	10	to 17	17½		3.51	to	3.59	
Black sheets, 24 gage	12	15	to 13	0		2.56	to	2.61	
Black sheets, Japanese specifications	15	5				3.06			
Steel hoops	10	15	and 12	10*		2.16	and	2.51*	
Cold rolled steel strip, 20 gage	16	0				3.21			

*Export price.
†Ex-ship, Tees, nominal.
(a) Nominal.

Continental Prices, All F. O. B. Channel Ports

(*Nominal*)

Foundry pig iron:								
Belgium	£3	9½s.	to £3	10s.	$15.64	to	$15.75	
France	3	9½	to 3	10	15.64	to	15.75	
Luxemburg	3	9½	to 3	10	15.64	to	15.75	
Basic pig iron:								
Belgium	3	7	to 3	7½	15.08	to	15.18	
France	3	7	to 3	7½	15.08	to	15.18	
Luxemburg	3	7	to 3	7½	15.08	to	15.18	
Billets:								
Belgium	5	0	to 5	2½	22.50	to	23.06	
France	5	0	to 5	2½	22.50	to	23.06	
Merchant bars:					C. per Lb.			
Belgium	5	12½	to 5	15	1.13	to	1.16	
Luxemburg	5	12½	to 5	15	1.13	to	1.16	
France	5	12½	to 5	15	1.13	to	1.16	
Joists (beams):								
Belgium	5	12½	to 5	14	1.13	to	1.14	
Luxemburg	5	12½	to 5	14	1.13	to	1.14	
France	5	12½	to 5	14	1.13	to	1.14	
Angles:								
Belgium	5	0	to 5	5	1.61	to	1.66	
⅛-in. plates:								
Belgium	6	17½			1.28			
Germany	6	17½			1.38			
¼-in. plates:								
Luxemburg	6	17½			1.38			
Belgium	6	17½			1.38			

some sign of stability, buying would be encouraged, but at the moment it seems to be a question of making continual concessions, to avoid closing down works altogether.

The drop in pig iron, that is to say, Cleveland iron, which may be taken as the index of values, has amounted during the past month to fully 3s. 6d. (78c.) and with Cleveland No. 3 at 80s. ($17.84) this material cannot be called dear in view of the high cost, but even Continental iron at from 7s. 6d. to 10s. ($1.70 to $2.23), a ton cheaper, f.o.b. Continental ports, does not attract consumers.

In the finished material departments the buying of sheets, both of black and galvanized, has dwindled down considerably, and whereas a few weeks ago galvanized sheet makers were comfortbly off, some now are beginning to want orders, owing to the lack of the usual seasonal Indian demand. Japan has bought fairly heavily of black sheets and now seems to be resting. Tin plate demand has not been anything important, but the mills are working at fully 85 per cent of capacity, while production ranges from 10 to 12 per cent above the pre-war rate.

John Lysaght, Ltd., Bristol, one of the important producers of black and galvanized sheets, has acquired a controlling interest in the Dominion Sheet Metal Co., Hamilton, Ontario.

A scheme has been projected for the construction of a tunnel under the Mersey to displace the ferry service, at present in use conveying goods to Liverpool from Birkenhead and other places. If put into operation, work will be found for many hundreds of men for about five years, the total cost being approximately £7,000,000 ($31,000,000).

In connection with the reports that the British steel industry has been neglected by the home railroads, and orders placed with foreign makers, it is interesting to note that during the current year the following orders have been placed with British mills: London, Midland & Scottish Railway, 120,000 tons rails, etc., 50 locomotives, 250 boilers, 1000 steel framed cars and 4 new steamers; the Great Western Railway 32,000 tons rails, 20,000 tons chairs and wheel tires and large quantities of electrical equipment in connection with the electrification of the line; London, North Eastern Railway group, a large number of locomotives, boilers, rolling stock, etc. The big extensions of the London Underground Railways also have been responsible for placing of contracts for thousands of tons of iron tunnel lining segments, bolts, nuts, rails, etc.

GERMAN GOODS PENETRATING

Longer Hours Produce Results—Lowering of Production Costs—German Tool Exports Inferior in Quality

BERLIN, GERMANY, Sept. 25.—The predicted era of sharp trade competition, a necessary outcome of the Dawes Reparations settlement, has begun. From all Germany's neighbors in Central and Northern Europe come reports of increasing German underselling, and from England comes the complaint that German construction materials are being increasingly imported at lower than English prices. The fact that the German increase in unemployment has come to an end, whereas the English unemployed again are increasing, and already number about 400 per cent more than in Germany, has brought into the sphere of discussion the coming German export boom.

Under these conditions have begun Germany's negotiations with Ally countries for commercial treaties. Minister of Industry Hamm declares that Germany will not let herself be forced into undesirable commercial concessions by political threats from France or elsewhere. The Rhenish-Westphalian trade press is urging the cabinet to fix heavy autonomous duties on steel, iron and finished metal goods, in order to have a lever for compelling England, France and Belgium to mitigate their restrictions upon imports from Germany.

Effect of Longer Hours of Work

In Austria and Scandinavia a campaign is being waged against German "social dumping" of machinery and technical appliances. "Social" here refers to the German standard of living as affected by the present lengthened working hours. Germany, which formerly led Europe in industrial-social progress, is intentionally, it is argued, falling behind in order to increase her competitive capacity. The Austrian socialists have proposed an amendment to the Government's tariff bill, imposing a 33 1/3 per cent supplementary duty on imports from countries where longer than 8 hr. are worked. Germany is the country aimed at. Herr Hamm has expressed the Marx cabinet's willingness to accept and ratify the Washington Agreement "in principle," but he adds that in practice Germany's present condition compels her to retain the 10-hr. day, which has been the rule in the steel industry since December, 1923. (See page 932, THE IRON AGE, Oct. 9.)

The Government's measures for reducing production cost have begun to bear fruit. The 10 per cent cut of railroad rates and the 10 per cent cut of coal prices have reduced industrial production cost by an average of 4 to 5 per cent. The calculated reduction is: pig iron, 4.2 per cent; sheets, 5 per cent; bars, 3.9 per cent. The reduction of the sales tax from 2½ to 2 per cent *ad valorem* and the Reichsbank's measures for cheapening credit will have powerful effects also. Essen experts declare that altogether the production cost of heavy steel and iron will fall by 7 or 8 per cent, and of finished metal goods by much more.

Export Surplus Increasing

The improvement in business is shown by a large export surplus in August, which is the second monthly export surplus this year. Detailed figures are not yet published, but the excess of exports over imports is known to have been over 120,000,000 gold marks. The July export surplus was 17,000,000 gold marks. But the iron and steel trade balance shows excess imports. July exports of iron and steel and wares (except machinery) were 116,529 metric tons, imports, 104,098 tons, but the exports included 25,245 tons of scrap. In the first seven months, exports of iron and steel and wares (except machinery) were 865,016 tons, imports 764,702 tons, but exports included 207,929 tons of scrap. Machinery exports in July were 25,153 tons, imports 1279 tons; in the first seven months exports were 147,636 tons, imports 5374 tons. Other exports and imports in seven months were (in metric tons):

	Exports	Imports
Pig iron	30,356	145,795
Bars, girders, etc.	98,155	273,967
Ingots, blooms, slabs, etc.	2,795	83,082
Sheets, rough	80,534	67,006
Wire	71,602	33,009
Rails, ties, etc.	7,864	81,415
Castings	45,187	6,305

The pig iron market has been inactive during the past fortnight; demand is small, and French and Belgian competition is felt. The demand for steel ingots, blooms, billets and slabs has somewhat increased, and for construction iron has materially increased. Thin sheets also are in demand and the market for wire has improved. The export trade in castings has become somewhat brisk.

Machinery and Tools

For home railroad material there are few orders, but increasing orders come from abroad. The Soviet Government has ordered machines, in particular printing machines, and technical appliances of various kinds. The market for tools is very bad. In the Solingen fine-steel branch the improvement continues. There is considerable home buying. The Essen *Bergwerks-Zeitung* declares that Solingen has spoiled its South American and Indian market by supplying goods far inferior in quality to the pre-war grades.

Solingen did little business at the recent Leipzig and Cologne fairs.

The machine tool concerns have received orders from the state railroad construction and repair shops. Increased orders have come from Spain, but business with Poland is bad. Present production of machine tools is about 45 per cent of the pre-war production. A large increase in orders for farm machinery from Italy, Poland, the Russian frontier states, Finland and the Balkans is reported. Home business in this branch is almost dead. The market for miscellaneous small iron and hardware goods is dull. Before the war 80 per cent of certain kinds of small iron goods were produced for export, and the lost markets have to be recovered. Of late there has been increased selling to Mexico and South America. An improvement in machinery export is expected from the pending commercial treaty negotiations. The present duties of many European countries are prohibitive. Under 14 out of the 44 numbers of the French customs tariff which refer to machinery, no imports from Germany were made in the first six months of 1924.

BELGIAN IMPROVEMENT WANES

Iron and Steel Market Feels German Competition and Prices Soften

BRUSSELS, BELGIUM, Oct. 3.—Signs of improvement registered two weeks ago have disappeared and the last Brussels market was quite flat, with a distinct tendency to ease, even for prices expressed in sterling. Inquiry is again slow, the few orders that have been passing being secured through considerable price rebates. On the other hand, there are rumors of further demands for wage increases on the part of labor, following the rise of the [cost of living] index number. German competition is more and more active.

Pig Iron.—The situation of chill-cast iron is a shade better, particularly for export. Lorraine and Luxemburg have raised their prices by 5 and 10 fr. to 320 to 330 fr. per metric ton ($15.70 to $16.20 per gross ton) for No. 3; there are few inquiries for basic at 310 fr. ($15.21).

Semi-Finished Steels.—The market is irregular but the tone somewhat steadier. Lorraine and Luxemburg are making lower quotations than the Belgian plants: basic blooms, 435 to 440 fr. ($21.35 to $21.60); billets, 460 to 465 fr. ($22.58 to $22.82); largets, 480 to 490 fr. ($23.56 to $24.05) per ton, delivered, or f.o.b. Antwerp.

Irons.—This section is calm, the tendency weak and producers are booking orders at any price; iron No. 2 is worth about 550 fr. ($27) for export; No. 3 560 to 570 fr. ($27.50 to $28).

Steel.—The slight depreciation of Belgian currency has caused prices to react. There are a few dealings for export to India and South America, while Japan and China are holding back. The rates for bars f.o.b. Antwerp are £5 15s. minimum (1.16c. per lb.), for large tonnages, and £5 15s. 6d. to £5 16s. 6d. (1.17c. to 1.18c.) as a current price. The lowest quotation for beams is £5 14s. (1.15c.). More activity is shown by Luxemburg than by Lorraine. The inland rates are: bars, 515 fr. (1.13c.); beams, 5 to 10 fr. lower; rods, 600 to 610 fr. (1.31c. to 1.34c.); hot rolled hoops, 770 fr. (1.69c.); cold rolled hoops, 1070 fr. (2.34c.).

Sheets.—Weakness again prevails, the depression being felt mostly in heavy sizes, where German competition is acute at £6 17s. 6d. (1.37c.) f.o.b. Hamburg or Bremen. Medium gages are 10s. higher. The Belgian rates, f.o.b. Antwerp, are now as low as £6 19s. (610 to 620 fr. or 1.34c. to 1.36c.); medium and light sheets are inclined to harden; 3 mm. (No. 11½ gage), 670 fr. (1.47c.); 2 mm. (No. 14 gage), 760 fr. (1.67c.); 1½ mm. (No. 16½ gage), 880 fr. (1.93c.); 1 mm. (No. 19½ gage), 1040 fr. (2.28c.); ½ mm. (No. 25½ gage), 1200 fr. (2.63c.).

Wire Products.—Business is sparse and secured with difficulty; prices are tending downward. Wire rod, 600 fr. ($29.45) or £6 5s. to £6 7s. 6d. for export. Plain wire No. 20 is 920 fr. (2.02c.); annealed, 970 fr. (2.13c.); galvanized, 1170 fr. (2.56c.); wire nails, 920 fr (2.02c. per lb.).

Scrap.—The market is depressed and business on a quiet scale, while prices are too high. Consumers are either living on their stocks or buying from hand to mouth only. Open-hearth, 240 fr. ($11.78); blast furnace, 210 fr. ($10.30); shavings, 190 to 200 fr. ($9.33 to $9.82); machinery castings, first choice, 315 to 330 fr. ($15.46 to $16.20).

GERMAN NON-FERROUS METALS

Imports Considerably Lower This Year, but Exports Are Higher Than Last Year

Imports of non-ferrous metals by Germany in the first six months of 1924 showed a decline in comparison with the corresponding period of 1923, despite economic dislocation in that year incident to the Ruhr invasion, according to Trade Commissioner William T. Daugherty, Berlin. The smaller 1924 importation confirms the otherwise critical situation in German industry, marked by capital stringency, credit shortage and accompanying high production costs, and low activity of the productive apparatus. Imports in the first six months of 1924 are considerably below the level of the first half year of 1922, when industrial operations were more nearly normal than at present.

Exportation of non-ferrous metals increased slightly over the corresponding 1923 level, except in the case of copper and zinc, which are, however, the leading bulk commodities among the non-ferrous metals. The table shows the quantitative comparison of imports and exports in the first six months of this year compared with 1923.

Foreign Trade of Germany During the First Half of 1923 and 1924

(In Metric Tons)

Metals	Imports 1923	Imports 1924	Exports 1923	Exports 1924
Copper	50,595	44,031	6,366	5,650
Zinc	19,817	16,903	3,392	3,092
Lead	17,206	15,340	3,693	5,608
Tin	3,327	3,973	402	1,557
Aluminum	2,334	2,579	39	440
Nickel	859	756	89	225
Antimony	795	663	25	32
Seven months...	94,933	84,245	14,006	16,605

FRENCH EXPORTS AND IMPORTS

Iron and Steel Statistics for First Seven Months of 1924

PARIS, FRANCE, Sept. 26.—The returns from January to July inclusive are as follows: Pig iron: Imports, 29,291 tons, compared with 40,214 tons last year. Exports, 425,965 tons, as against 318,012 tons.

Ferroalloys: Imports, 6011 tons, as against 3791 tons. Exports, 12,158 tons, as against 11,721 tons.

Iron and steel, rolled, etc.: Imports, 408,864 tons, as against 287,796 tons. Exports, 1,407,825 tons, as against 966,332 tons.

Steam engines and others: Imports, 86,193 tons, as against 89,948 tons. Exports, 50,961 tons, as against 47,023 tons.

Boilers: Imports, 6599 tons, compared with 8247 tons. Exports, 4384 tons, as against 3049 tons.

Machine parts: Imports, 15,648 tons, as against 14,433 tons. Exports, 36,051 tons, as against 27,284 tons.

Metal tools and castings: Imports, 48,549 tons, as against 42,632 tons. Exports, 183,147 tons, compared with 178,169 tons.

Reflecting the sustained improvement in the iron and steel industry of the Mahoning Valley is the September payroll of $6,092,918, an increase of $408,696 over August and $525,202 over July. This gain was registered despite the Labor Day holiday. From present indications the October wage disbursement will be still better. For the first nine months of this year, industries at Youngstown distributed $57,474,362.

Sloss-Sheffield Steel & Iron Co. to Acquire Alabama Co. Properties

Negotiations which have been under way for some time are now regarded as virtually completed for the purchase by the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., of the physical properties of the Alabama Co., also of Birmingham. The transaction is subject to the approval of the directors of both companies and of the majority stockholders of the Alabama Co.

The Alabama Co. is the successor to the Alabama Consolidated Coal & Iron Co., having acquired the latter in April, 1913. Its properties include the two Clifton blast furnaces at Ironaton, Ala., and the two Etowah furnaces at Gadsden, Ala. The Clifton furnaces, capacity 100,000 tons a year, date back to the eighteen eighties, one of them having been last rebuilt in 1914. The Etowah furnaces were built in 1903 and 1905, and the No. 2 furnace was rebuilt in 1918. They have a capacity of 200,000 tons a year. Three coal mines, with capacity of 750,000 tons a year, are located at Brookwood, Searles and Lewisburg, Ala., and there are 885 coke ovens with rated capacity of 340,000 tons a year. There are 10,984 acres of iron ore lands, representing deposits of both red and brown ore, in Etowah, Talladega and Jefferson Counties, Ala., in Polk County, Ga.; also 29,185 acres of coal lands in Tuscaloosa and Jefferson counties, 14,577 acres of timber and farm lands in Alabama, 320 acres of limestone quarries at Rock Springs, Ala., besides 9033 acres of mineral rights in Coosa County, Ala. The company also owns a railroad nine miles long, from East Birmingham, Ala., to its Lewisburg coal mines. The output of the various properties in 1923 amounted to 121,171 tons of pig iron, 938,256 tons of coal, 293,153 tons of coke and 308,218 tons of iron ore.

The capital stock of the Alabama Co. is $2,000,000 common, $600,000 first preferred and $1,500,000 second preferred. The bonded debt includes $953,000 of Alabama Consolidated 5s, $640,000 Alabama Co. general gold 6s and $200,000 10-year gold 8s.

The Sloss-Sheffield Steel & Iron Co. has seven blast furnaces—four in the Birmingham district, two at Sheffield and one at Florence, Ala., with a capacity of 600,000 tons of pig iron a year. The purchase of the Alabama Co. properties would give it 11 furnaces with an annual capacity of 900,000 tons of pig iron. J. W. McQueen, Birmingham, is president, and Hugh Morrow, Birmingham, vice-president. Waddill Catchings of Goldman, Sachs & Co., New York, is chairman of the board of directors.

Siemens-Schuckert Manager Visits American Electrical Works

Dr. Carl Koettgen, director of the Siemens-Rhein-Elbe-Schuckert Union and general manager of the Siemens-Schuckert Werke, accompanied by Director Fritz Ludwig, manager of the electric motor works of the Siemens-Schuckert company, who recently arrived in the United States to study the latest American electrical developments, are in the Pittsburgh district this week. Their itinerary will probably include Chicago, Detroit and St. Louis, ending in New York in about a month. Accompanying them as far as Pittsburgh is Director Hermann Reyss, general manager of the foreign department of the union. Mr. Reyss arrived Oct. 11 and probably will go to the Far East before returning to Germany.

Dr. Koettgen has been prominent in the development of electric power in Germany for all industrial purposes, especially for mines and steel works. He built the first large electric main hoisting engine in 1900, introducing the Ilgner principle with flywheel effect, and in 1902 he installed the first large electric reversible rolling mill. In 1907 he took over the management of Siemens Brothers Dynamo Works in England. Following the armistice he became general manager of all the factories of the Siemens-Schuckert Werke and later was made general manager of the company.

He is a director of the Gelsenkirchner Bergwerks & Huetten A. G., the Deutsch-Luxemburgische Bergwerks & Huetten A. G., two of the leading German steel companies, and a member of the board of the Siemens-Rhein-Elbe-Schuckert Union, the great European industrial combination employing more than 280,000 men. Dr. Koettgen is known for his interest in engineering standardization, economics and labor questions. He is president of the Reichskuratorium fuer Wirtschaftlichkeit.

Purchasing Agents' Convention

The national convention of the Association of Purchasing Agents in 1925 will be held in Milwaukee and the dates May 25-28 have been selected, according to announcement by Walter H. Wenzel of the Vilter Mfg. Co., national director representing the Milwaukee Association and chairman of the convention. The informashow will include equipment and supplies from all parts of the country.

Secretary Hoover Discusses Economies in Distribution

The National Industrial Advertisers Association held its annual convention at the Edgewater Beach Hotel, Chicago, Oct. 13 and 14. Advertising and sales executives from all parts of the country were in attendance. Among the speakers were J. R. Hopkins, Chicago Belting Co.; Julius S. Holl, Link Belt Co., Chicago; F. R. Davis, General Electric Co., Schenectady, N. Y.; R. C. Beadle, International Combustion Engineering Corporation, New York; P. L. Thomson, Western Electric Co., New York, and Bennett Chapple, American Rolling Mill Co., Middletown, Ohio.

Secretary Hoover of the Department of Commerce had written a paper on the "Elimination of Waste in Distribution," which was read at the first session, Monday morning. Mr. Hoover said that the great problem in business today is reduction of the cost of distribution. He emphasized the necessity for a closer study of economic trends. Another suggestion was that instead of aiming to sell nationally many manufacturers would find that by limiting their efforts to more circumscribed areas and intensifying their sales activities in such areas, they would not only reduce their selling costs but would probably produce a larger volume of business. He also urged a broader use of statistics. "They can be regarded as a business barometer and could undoubtedly be employed to advantage by sales and advertising departments as well as by the producing departments, especially in industries like those represented in your association which are selling to the manufacturer."

A wealth of information is contained in a 50-page pamphlet issued by the Chamber of Commerce of the United States, Washington. The figures relate to business done in 1923 in more than 30 of the largest communities in the United States, and shows expenditures for various groups of commodities by families, for the cities and adjacent territories. The analysis distributes the population according to race, sex and age groups, shows the number of persons engaged in gainful occupations, the number of homes rented, as compared with those owned, and various other information. Much of the data, of course, came from reports of the United States Census Bureau, although the business figures were acquired from other sources.

STEEL SHEET SIMPLIFICATION

Manufacturers, Distributors and Consumers Adopt Important Recommendations

ATLANTIC CITY, Oct. 14.—More than 70 representatives of sheet steel manufacturers, distributors and consumers meeting this afternoon adopted a simplification of sizes for steel sheets proposed by a committee of the sheet steel industry headed by Walter C. Carroll, vice-president of the Inland Steel Co. The meeting, held under the auspices of the Division of Simplified Practice, Department of Commerce, indorsed the addition of but two sizes to the recommendations, these being 36 x 96 in No. 18 gage one pass cold-rolled box annealed sheets and 24 x 96 in. No. 14 gage blue annealed sheets. This means a reduction from 1819 items to 263. Adoption of this was unanimous and will be effective Jan. 1 for a period of six months, when it will be referred to a revision committee comprising representatives of the manufacturers, the metal branch of the National Hardware Association of the United States, the National Association of Sheet Metal Contractors, the jobbing manufacturers, the Bureau of Standards, the Federal Specifications Board, the American Engineering Standards Committee and the Chamber of Commerce of the United States. It was voted to eliminate all gages lighter than 28 gage full weight for galvanized and painted roofing.

At a subsequent meeting under the same auspices, it was voted to eliminate 2½ and 3½ in. conductor pipe, 3 and 4½ in. eaves trough. As to eaves troughs a motion was made that no eaves trough or conductor pipe be made lighter than No. 28 full weight and that the No. 27 gage be eliminated. The same applied to all fittings and accessories in another resolution adopted. Discussions showed that the sentiment was strongly against the use of light gages.

Simplification of Sizes for Steel Sheets Adopted at Atlantic City Meeting

GALVANIZED FLAT SHEETS

Gage																
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48x96	48x120	.....	.....	.....
14	.....	.....	.....	.....	.....	.....	28x120	30x96	30x120	36x96	36x120	48x96	48x120	.....	.....	.....
16	24x96	.....	.....	.....	.....	.....	28x120	30x96	30x120	36x96	36x120	48x96	48x120	.....	.....	.....
18	24x96	24x120	*26x96	.....	.....	28x96	28x120	30x96	30x120	36x96	36x120	.....	48x120	.....	.....	.....
20	24x96	24x120	*26x96	.....	.....	28x96	28x120	30x96	30x120	36x96	36x120	48x96	48x120	.....	.....	.....
22	24x96	24x120	*26x96	.....	.....	*28x96	28x120	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
24	24x96	*24x120	*26x96	*26x120	.....	28x96	28x120	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
26	24x96	*24x120	*26x96	*26x120	*28x84	28x96	28x120	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
28	24x96	*24x120	26x96	*26x120	*28x84	28x96	28x120	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
29	.....	*24x120	26x96	*26x120	*28x84	28x96	28x120	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
30	24x96	.....	*26x96	.....	.....	.....	28x120	30x96	30x120	36x96	.....	.....	.....	.....	.....	.....

ONE PASS COLD ROLLED BOX ANNEALED SHEETS

16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18	24x96	.....	.....	.....	28x96	.....	.....	30x96	.....	36x96	.....	.....	.....	.....	.....	.....
20	24x96	.....	.....	.....	28x96	†28x108	.....	30x96	30x120	36x96	36x120	.....	48x120	.....	.....	.....
22	24x96	.....	.....	.....	28x96	†28x108	.....	30x96	30x120	36x96	36x120	.....	48x120	.....	.....	.....
24	24x96	24x101	.....	.....	28x96	†28x108	.....	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
26	24x96	24x101	.....	.....	.....	.....	.....	30x96	30x120	36x96	36x120	.....	.....	.....	.....	.....
28	24x96	24x101	.....	.....	.....	.....	.....	30x96	.....	36x96	.....	.....	.....	.....	.....	.....
29	.....	24x101	.....	.....	.....	.....	.....	30x96	30x120	36x96	.....	.....	.....	.....	.....	.....
30	.....	.....	.....	.....	.....	.....	.....	30x96	.....	.....	.....	.....	.....	.....	.....	.....

BLUE ANNEALED SHEETS

8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	†48x240	†66x240
10	24x96	.....	.....	.....	.....	.....	.....	30x96	30x120	36x96	36x120	*36x144	48x120	†36x168	†48x156	†60x156
12	24x96	.....	.....	.....	.....	.....	.....	30x96	30x120	36x96	36x120	*36x144	48x120	.....	.....	.....
14	24x96	.....	.....	.....	.....	.....	.....	30x96	30x120	36x96	36x120	*36x144	48x120	.....	.....	†60x120
16	24x96	.....	.....	.....	.....	.....	.....	30x96	30x120	36x96	36x120	*36x144	48x120	.....	.....	.....
10	42x96	48x96	†72x96	†72x120	†72x144	†72x156	.....	*.....	60x96	60x120	.....	48x144	60x144	.....	.....	.....
12	42x96	48x96	.....	.....	.....	.....	.....	42x120	60x96	60x120	.....	48x144	60x144	.....	.....	.....
14	42x96	48x96	.....	.....	.....	.....	.....	42x120	.....	.....	.....	48x144	.....	.....	.....	.....
16	42x96	48x96	.....	.....	.....	.....	.....	42x120	.....	.....	.....	48x144	.....	.....	.....	.....

CORRUGATED ROOFING AND SIDING

GALVANIZED—Present standard widths and corrugations—In even foot lengths 5 ft. 0 in. to 12 ft. 0 in. in 29 gage and heavier, *even gages.*

PAINTED—Present standard widths and corrugations—In even foot lengths 5 ft. 0 in. to 12 ft. 0 in. in 28 gage and heavier, *even gages.*

ROOFING—(*All other Styles and Patterns*)

GALVANIZED—Present standard styles and patterns in 29 gage and heavier, *even gages.*

PAINTED—Present standard styles and patterns in 28 gage and heavier, *even gages.*

LEGEND

*Two sheet mills recommend item thus marked be eliminated. (Total 22 items)

†Two other sheet mills recommend items thus marked be added. (Total 13 items)

Working of Freight Rate Adjustments

YOUNGSTOWN, Oct. 14.—District iron and steel companies are working intensively on freight rate adjustments and equalizations which will give producing interests in the Mahoning and Shenango Valleys a strengthened competitive position. It is hoped to secure adjusted freight charges to St. Louis and other Southwestern consuming centers.

District companies have joined with producers in Wheeling, Buffalo and Pittsburgh in a protest filed by the Jones & Laughlin Steel Corporation, Pittsburgh, designed to correct an alleged inequality in the freight rates on steel from these territories to St. Louis, as compared with the charge from Chicago. It is the contention of the complainant interests that the rates which are being attacked are out of proportion to the Chicago rate.

This case is regarded as but the preliminary of others which are now being prepared, for submission to the railroads and the Interstate Commerce Commission. In Youngstown, the traffic department of the Chamber of Commerce, under direction of H. D. Rhodehouse, is supervising the compilation of data in support of the district contention.

The policy of meeting delivered competitive prices is still being adhered to by Valley independents, especially in the Chicago district, where the larger companies are endeavoring to retain their selling territories. However, it is realized that as soon as Chicago district mills begin to fill up, the surplus tonnage will go to Eastern producers, who will then be in shape to name their own prices to a considerable extent.

Commercial stocks of bituminous coal are estimated by the United States Geological Survey for Sept. 1 at 47,000,000 tons, which is equivalent to 45 days' use, based on the average rate of consumption during the three months preceding. This compares with 51,000,000 tons June 1, or 49 days' use, and with 62,000,000 tons Jan. 1 last, or 46 days' use at the much higher rate of use prevailing at that time.

Largest Production of Coke in the History of the Industry

WASHINGTON, Oct. 14.—The largest in any year in the history of the industry, even exceeding the war-time maximum, the total output in 1923 of beehive and by-product coke combined was 56,977,000 net tons, according to final returns of a statistical canvass on coke and by-products just announced by the United States Geological Survey. The final figures are 2.7 per cent higher than the preliminary estimates published Jan. 15, 1924.

Of the production, 37,597,664 tons, valued at $257,591,318 or about 66 per cent of the total, consisted of by-product coke while 19,379,870 tons, valued at $115,905,580, was beehive coke. The average yield of coke from coal in the case of by-product fuel was 69.3 per cent, while in the case of beehive coke, it was 64.4 per cent.

The returns involved 11,156 by-product ovens, of which 3094 are in Pennsylvania; 1619 in Ohio; 1213 in Indiana and 1196 in Alabama, with the others scattered. The by-product coke used in blast furnaces or affiliated work amounted to 27,055,397 tons, valued at $168,379,600.

Merchant sales of furnace by-product coke totaled 1,460,538 tons, valued at $9,847,055, while sales of by-product coke for foundry use aggregated 1,897,955 tons, valued at $19,995,342. By-products obtained from coke oven operations and sold in 1923 were valued at $112,075,945. Of this total 884,952,912 lb., valued at $25,954,413, consisted of ammonia sulphate as against a production of 915,926,762 lb. Motor benzol products totaled 80,467,883 gal., while the amount sold exceeded this somewhat and consisted of 80,480,326 gal., valued at $13,145,833.

Of the beehive coke produced last year, 6,437,771 tons, valued at $39,326,693, consisted of merchant sales of the furnace grade, while foundry beehive coke sales amounted to 1,702,764 tons, valued at $12,259,196. The production of beehive coke reported came from 62,349 ovens, of which 37,578 are in Pennsylvania, 8055 in West Virginia, 6199 in Alabama, 3284 in Virginia, 1767 in Tennessee, 1758 in Colorado, and 1030 in New Mexico, the remainder being scattered.

Youngstown Company Sells Tri-State Engineering Co.

In pursuance of its policy to divest itself of all properties not directly engaged in the manufacture of iron or steel, the Youngstown Sheet & Tube Co., Youngstown, has sold the Tri-State Engineering Co., whose plant is located at Zanesville, to L. A. Woodard and associates of Wooster, Ohio. The property was acquired by the Sheet & Tube company in the purchase of the Steel & Tube Co. of America, which operated it as a subsidiary. Mr. Woodard, the purchaser, was formerly manager at Youngstown of the William Tod plant of the United Engineering & Foundry Co., Pittsburgh, and was subsequently engaged in the machine trade at Wooster, where he controlled a plant.

The Sheet & Tube company has negotiations under way to sell the plant at Kalamazoo, Mich., of the Harrow Spring Co., also acquired when the Steel & Tube company was taken over.

The services given by the Tri-State Engineering Co. cover not only mechanical repair and maintenance in all the branches covered, but also the production of patterns and castings; building of steam engines, clay working equipment, mine cars, sand mills, steam boilers, machine parts, tanks, condensers, evaporators, stacks, breechings, conveyors, kiln fittings, power presses, standpipes, structural towers, trusses, special molds, dies, coal chutes, screens and machinery to order.

The plant includes a foundry and machine shops, also pattern, forge, boiler and structural shops, all of which are equipped with substantial machinery reinforced by electric, air and oxy-acetylene tools.

The foundry has in connection two cupolas, one 36 in. and the other 48 in., giving a maximum melt of approximately 45 tons. Three stationary revolving jib cranes are used for transferring and pouring. This department also contains a triplex metal furnace for the making of brass, bronze and aluminum castings; the main foundry product, however, consists of gray iron and semi-steel castings. Running on average castings, the foundry's capacity is 200 tons monthly, while the limit as to the largest casting is 32,000 lb.

In the mechanical department, general machine repair work is done, and the castings from the foundry are finished and assembled into various machines.

The company is one of the principal manufacturing concerns in Zanesville. It is likely new equipment will be installed, as some of the machinery needs replacement.

Bennington Scale Mfg. Co. in New Hands

Manufacturing equipment of the Bennington Scale Mfg. Co., Bennington, Vt., has been moved into a section of the Fanning-Schuett Engineering Co. plant at Third and Cayuga Streets, Philadelphia, the Fanning-Schuett company having purchased the scale manufacturing business and having brought from Vermont the engineering force and part of the shop force employed by the Bennington company. The purchaser will undertake production of the same type of suspended platform scale which it has distributed for the Bennington company in the Philadelphia territory since 1922. The new business will be conducted as the Bennington Scale Mfg. Co.

The Fanning-Schuett Engineering Co. designs and manufactures complete coal yard equipment, having a large engineering department, fabricating shop and erection department. The new management states that operations in its new scale manufacturing department will be continued at the present location until new quarters can be built for this work.

Urges National Team Work

A national spirit of team work was stressed as America's great need by ex-Governor James Hartness of Vermont, president of the Jones & Lamson Machine Co., Springfield, Vt., and president of the American Engineering Council, in an address given Oct. 2 before the American Construction Council at the Hotel Biltmore, New York.

"This country," said Mr. Hartness, "has reached the stage in its development in which all interests must take a broad national view. National team work will increase the wealth to be divided and reduce the cost of production. This spirit of team work, by creating more values, will make it possible to gratify the demand for higher wages and shorter hours. In other words, industrial war over the division of the fruits of labor will be ended."

One of the first tasks of a nationwide spirit of co-operation was said to be to find a way to reduce the necessity for destructive contests, the lack of understanding and appreciation of the work and services of others being said to have precipitated many of our contests, and to have interfered seriously with our prosperity and progress.

Management Week to Be Observed in Many Cities

The third annual national observance of management week will take place Oct. 20 to 25, when meetings will be held in about 70 cities in the United States and Canada. At Chicago two meetings will be held Wednesday, Oct. 22, an afternoon session in the assembly hall, Western Society of Engineers, Monadnock Block, and an evening session at the City Club. They will be under the joint auspices of the local sections of the Society of Industrial Engineers, American Society of Mechanical Engineers, Taylor Society, National Association of Cost Accountants, American Management Association and the Western Society of Engineers.

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ESTABLISHED 1855

THE IRON AGE

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The Aluminum Company

A POLITICAL candidate makes charges against the Aluminum Co. of America for the reason that Secretary Mellon happens to be largely interested in it. The Federal Trade Commission brings out a report to the general effect that the company is a violator of the Sherman law. The Department of Justice says that it will look into things, and if proper will take action. The daily press raises a general hullabaloo. There is produced the common impression that the Aluminum company is a malefactor of great wealth; that it is an extortionate monopoly fostered by a political party. The facts are open to anybody who cares to take the trouble to become acquainted with them. Let us see what they are.

The Aluminum Co. of America, or rather a humble predecessor, nearly 40 years ago undertook to exploit the patents of Charles M. Hall, a meritorious but struggling young technical man, for the economical production of aluminum, which was then a non-commercial metal. Under the guidance of Mr. Hall, and with the assistance of the financiers and administrators who became interested with him, this process developed into a new art of metallurgy and in the course of time the company waxed greatly and became very prosperous.

The ore of aluminum is known as bauxite, and as the company grew it naturally began to acquire deposits of that mineral so as to furnish it with its own supply of raw material. The ore was of little value to anybody else, for so long as the Hall patents were alive no one else was free to make aluminum by their economical method. In the course of time the Aluminum Co., in order to fortify itself, reached out abroad and acquired bauxite mines in Dutch Guiana, spending a great deal of money for such explorations and exploitations. These things were the foundation of the Aluminum company, and, of course, in laying this foundation there was nothing that was criminal or in violation of the Sherman law, or in any way reprehensible. On the contrary, the company was creating a new industry, which furnished employment to a great many men and conferred upon the American public the inestimable benefit of relatively cheap aluminum, so that it took rank among our principal non-ferrous metals.

The Hall patents, which gave the company its legal monopoly, expired about 15 years ago, since which time their process has been open to use by anybody. Naturally, however, the company had acquired knowledge and experience that continue with it. Such accumulated knowledge is always an asset of immense value. It constitutes a part of what some economists characterize as "intangible wealth." Persons of the type of LaFollette and Brookhart do not recognize such wealth, but industrialists are aware that it may exceed the wealth that is represented by bricks and mortar.

Outside of the Aluminum Co. of America there are few, if any, metallurgists who know how to produce aluminum. If anybody wants to produce copper or lead, he can quickly hire all of the technical assistance that is needful, can pick it up almost on the street; but not so in the instance of aluminum. However, the aluminum industry was instituted in Europe under the Heroult patents about contemporaneously with the beginning of the industry in the United States.

Rather more than 10 years ago one of our great metallurgical companies, which had European affiliations and was able to obtain technical assistance from abroad, was minded to enter upon the production of aluminum in this country, as a competitor, but in the end it came to the conclusion that it did not have the stomach for it. Consequently the Aluminum Co. of America has continued to be the sole producer. That is certainly not a crime. If it be any ground for discontent it is equally certain that the company is not responsible for it.

Now, what is the economic position of a concern that is a sole producer, whether by virtue of patent monopoly or otherwise? Hypothetically it can be as extortionate as it pleases. Practically it must be obedient to the law of supply and demand, not to the same extent as if it had direct competition, but nevertheless obedient. Every

business organized on a large scale finds its great profit in volume. A sole producer must offer his commodity down so as to induce the public to use it and thereby swell the volume of sales and diminish the cost of production. Everybody acquainted with the metal business knows that the Aluminum Co. of America has conformed to such a policy, to which a broad vision of proper administration would constrain it anyhow.

The Aluminum Co. of America has not been free from the competition of other producers, for it has been subject at all times to the competition of those in Europe. Notwithstanding such tariff protection as it has had, the imports of foreign aluminum have been rather large, especially at some times. But quite apart from that, aluminum has always been in competition with other metals. Indeed, the inroad of aluminum upon their market has steadily been a dread of the copper producers, and they have had some experiences that have taught them that their fears were not idle.

In very many ways, such as for automobile construction and for domestic purposes, aluminum is useful and desirable, but it is not indispensable. Of all the important non-ferrous metals aluminum is probably the one that we could discard most easily if we had to. Without offering these explanations and interpretations, the Federal Trade Commission really does not make any charges that amount to anything beyond what is contained herein.

The Long Pull in Machine Tools

PRESIDENT RALPH E. FLANDERS, in addressing the National Machine Tool Builders' Association last week, said that "the day of reckless optimism is over." It has been borne in upon men in the machine tool industry as upon no other class in the metal trades that their business is now and probably will continue to be on a different basis from that of the 1915-1920 period. Then orders came in large units and at exceedingly profitable prices. The call for American machine tools from warring countries in Europe, followed by the unprecedented demand in the United States, once this country got into the world war, put the industry on a basis of inflation from which it has been readjusting more slowly perhaps than any other. Many plants were enlarged greatly and many new ones sprang up. Gradually the weaker companies which were a product of the war boom have been eliminated by the inevitable law of business survival; the enormous stocks of excess machine tools, both new and used, have been reduced considerably, and the industry faces the future with more optimism than it has been able to muster in several years.

It was natural that recovery from after-war depression should be slower in machine tools than in steel. Much of the steel called for by the war was used up in the war. At all times much of the steel that goes into consumption is used up. On the other hand, machine tools have a lifetime varying from a few years to several decades. Not only were machine tool builders left in 1918 with unsold stocks and excess manufacturing capacity, but the release of much equipment from war work created such a great surplus of the tools of industry that they have not yet been absorbed.

A speaker at the Lenox convention stressed the point that not only must machine tool builders make new appeals by style and design to create new markets, but that further contraction of machine tool capacity should be brought about by mergers and by disposing for other manufacturing purposes of plants created during the war boom.

A cooperative advertising campaign of education is one method the association plans to use for stimulating interest among buyers. But assuming that the results of such a campaign meet reasonable expectations, it will take years for the country to grow up to the present capacity for the manufacture of metal-cutting tools. The lack of export demand since the war has affected machine tools in common with other of our products, and the Lenox meeting did well to emphasize the need of new campaigns for foreign markets.

Scrap in Steel Making

THERE has been so much theorizing on the relation of scrap to steel making that it seems well to compile a comprehensive summary of what has actually occurred. The table given below includes statistics of production of basic open-hearth steel ingots and castings and of basic pig iron from 1896, the first year for which such production statistics were gathered, and the percentage of pig iron to steel is computed for each year.

It was a familiar prediction 15 years and more ago that eventually the supply of scrap would begin to fail, so that a much larger percentage of pig iron would have to be used. Events have justified those predictions only to a limited extent.

In recent years there have been other theories that have not been borne out. For instance, there was the theory that the war left a great deal of scrap, so that the proportion of scrap used in steel making would be high for a time, and then more pig iron would have to be supplied. The actual record fails to disclose any such trend. No doubt the influence existed, but it was neutralized by other things.

In fact, the chief thing shown by this presentation of statistics over a period of 28 years, during which the production of basic open-hearth steel was multiplied by more than two score, is that there has not been much change in the long run in the proportions of pig iron and scrap used, and not even much change from one year to another.

This does not mean that conditions have not changed from time to time. The inference rather is that there have been various compensating influences.

It must not be assumed that the percentages given in the table, of basic pig iron production to basic open-hearth steel production, indicate precisely the respective proportions of pig iron and scrap actually charged into the furnaces. The pig iron as weighed is scarcely 95 per cent iron, and if 5,000,000 tons of pig iron is made in a year and 10,000,000 tons of steel, slightly more than

5,000,000 tons of scrap will have been put into furnaces. Some iron, however, is obtained by ore additions. Again, stocks of pig iron vary, so that production in a year is not precisely the same as consumption.

In the early years of the basic open-hearth industry a very large proportion of scrap was used and the pig iron production got down to 40 per cent in 1901. Then it swung up and an average of about 60 per cent is seen in the five years before the war. In the five years since the war it has been about 54 per cent, indicating less pig iron and more scrap. This is not due to scrap left from the war, since the first three years after the war, lumped together, showed 54.0 per cent and the next two years 53.3 per cent, or practically the same thing. The coal strike of 1922 made pig iron hard to get and cleaned up scrap, the next year equalizing, so that the two years should be considered together.

Relation of Basic Pig Iron to Basic Open-Hearth Steel Ingots and Castings

	Basic Steel Gross Tons	Basic Pig Gross Tons	Pig Iron Per Cent
1896.....	776,256	336,403	43.4
1897.....	1,056,043	556,391	52.5
1898.....	1,569,412	785,444	50.0
1899.....	2,080,426	985,033	47.3
1900.....	2,545,091	1,072,376	42.1
1901.....	3,618,993	1,448,850	40.0
1902.....	4,496,533	2,038,590	45.4
1903.....	4,734,913	2,040,726	43.1
1904.....	5,106,367	2,483,104	48.6
1905.....	7,815,728	4,105,179	52.5
1906.....	9,658,760	5,018,674	52.0
1907.....	10,279,315	5,375,219	52.2
1908.....	7,140,425	4,010,144	56.2
1909.....	13,417,472	8,250,225	61.5
1910.....	15,292,329	9,084,608	59.5
1911.....	14,685,932	8,520,020	58.0
1912.....	19,641,502	11,417,886	58.0
1913.....	20,344,626	12,536,693	61.5
1914.....	16,271,129	9,670,687	59.4
1915.....	22,308,725	13,093,214	58.7
1916.....	29,616,658	17,684,087	59.7
1917.....	32,087,507	17,671,662	55.0
1918.....	32,476,571	18,646,174	57.4
1919.....	25,719,312	14,494,131	54.2
1920.....	31,375,723	16,737,722	53.4
1921.....	15,082,564	7,753,071	51.4
1922.....	28,387,171	13,841,367	48.8
1923.....	34,665,021	19,795,590	57.1

The increase in demand for scrap was very rapid, on account of the rapid increase in basic open-hearth steel tonnage, and it was particularly sharp after 1906, for then the Bessemer steel industry, which had supplied much works scrap, declined. One of the compensations was that scrap consumed by iron mills decreased. Another was that consumption by iron foundries did not increase so rapidly as did the total outcome of scrap. Finally, old material comes out in increasing volume even though steel production may increase only slightly.

New Area for Simple Alloy Steels

THE adoption by a few American railroads of a high-manganese steel for important locomotive parts calls attention to the value of such steel for both castings and forgings. Some details were given in an IRON AGE article of Oct. 2. This steel, containing 1.25 to 1.75 per cent manganese, is a simple alloy steel—one of a class that is growing in favor rapidly. Gaining a foothold during the war as cast steel anchor chain and in other forms, it has been tried more recently in other fields and with success. One railroad is getting satisfactory results with rail steel containing about 1.25 per cent manganese. A large automobile manufacturer has used a like steel in almost all its forgings.

This development is one of several pointing to an increasing reliance on simple alloy steels. What is true of manganese steels has proved true of vanadium steel, molybdenum steel and others in which a single alloying metal has been incorparted. Properties have been developed which heretofore have not been expected from such combinations. Even mild carbon steels, by special water quenching, have been made to equal some expensive alloy steels in tensile strength and other physical values. Interesting results of this sort were described in a paper read at the June meeting of the American Society for Testing Materials.

Without doubt we shall see an increasing use of the simple or one-alloy steels, particularly where the tonnages involved preclude consideration of the more expensive combinations. The specifying of so-called silicon steel, as well as of silico-manganese steel, for bridges and buildings is an illustration. Moreover, it is even prophesied that, with certain refinements in the melting process, the contributions of the newer science of heat treatment will yet confer on plain carbon steel physical properties only lately attributed to alloy steels and to alloy steels alone.

Trade Swings and Forecasts

WHEN the practice of attempting to forecast the course of general business came into such vogue in the past few years, a natural inquiry was, how would the making, and the acceptance, of these forecasts affect the course of affairs?

Obviously if a forecast of an important upward or downward swing in business were generally accepted and acted upon, the actions would constitute an influence of their own, causing the swing to come sooner than it otherwise would have come. Thus in a measure the forecast would defeat its object. The forecast would be more helpful to the individual business man if his competitors did not have the benefit of it.

We have had phenomena in the past four years in the swings of trade volume that seem to find little precedent in the course of affairs before the war. The dropping off in activity from 1920 to 1921 was more violent than had been seen before the war, and the swings since then have been of shorter duration. The changes might be called fluctuations rather than actual swings.

The course of trade since the war even might be described as a vacillating one. Possibly this uncertain course has been due chiefly to the unsettlement left by the war, but it will be well to consider whether the disposition to indulge in forecasting may not have been an important influence, both to produce minor swings and to forestall major swings. Whether the forecasts are really helpful to trade in general is another question entirely. Business men observe that they have been somewhat lacking in the important time element. The average business man has no difficulty in observing for himself the direction of the trend in trade, and what he most desires

to get is an estimate of how long the observed trend is going to continue.

If the course of steel production is any criterion at all as to the character of general trade, the movements have been quite erratic, for we have had much shorter and sharper swings in the rate of steel production than before the war. But if iron is no longer the barometer of trade, the business of forecasting is deprived of one of its principal reliances.

We have had the experience for approximately three years past of the trade swings being relatively unimportant, by reason of the frequent reversals and the shortness of both ups and downs. It remains now to be seen whether we shall have any great and prolonged upward or downward swings, any really long spell of great activity or great inactivity, and whether the forecasters will be able to predict such movements if they are to occur, whether it will be possible, in advance, to distinguish major movements from the minor movements we have been having.

Pittsburgh Plus Mail Bag

MANY letters have come to THE IRON AGE in the past three weeks, some of them raising questions which are coming up in the everyday transactions of buyers of steel, and others commenting on various phases of the new régime which have been touched on in these columns.

Newspapers in localities which look for the building of more steel works at a distance from the Pittsburgh district have created a belief that such construction work will come along in good volume. Some of our correspondents have asked as to the outlook in this respect. Our reply to all such inquiries is in effect that nothing will be lost by an attitude of caution and of waiting for developments. Seeing that the steel making capacity of the country was so greatly increased during the World War, and that for a considerable part of the time since the war less than 60 per cent of the capacity has been employed, neither the present nor the near future seems to be a time for extensive building. Besides, the conditions which have arisen since the abolition of Pittsburgh plus are such that no man can measure accurately what the ultimate effects will be. Hence it is highly important to investigate carefully and move slowly before deciding upon building new plants.

An appreciation of THE IRON AGE'S editorial headed "Complexities in Buying Steel" comes from one of our reader correspondents who writes: "This article, coupled with that appearing on another page, gives much valuable information in compact form and will enable any ordinary reader to grasp the essentials of the new order of things growing out of the abandonment of the Pittsburgh plus method of pricing steel. Several of my friends who are not in any way connected with the steel trade and know little, if anything, of its operations, but who were interested in this recent decision, have read these articles and have spoken of the clearness with which this subject is handled."

An iron and steel factor, who has represented in the Chicago district several mills located farther east, writes for a suggestion as to a possible new account, his letter explaining: "One of my connections is the —— —— ——. In view of the mills complying with the ruling of the Federal Trade Commission that they abolish Pittsburgh basing, I do not expect to be able to sell much tonnage for this company from now on. I shall therefore have some time to devote to another line and am looking for a new connection."

By some manufacturing consumers of steel the new régime is viewed in the light of an opportunity to lengthen the radius of their market. One such writes us from a Southern manufacturing town to ask about his chances for launching out upon a national business. Hitherto he has not been able to compete with manufacturers, in the East and Northwest, of a certain product into which steel enters, the reason being that his steel "has always come with the Pittsburgh to Atlanta freight added," though he draws his supply from an Atlanta mill. He is now thinking of preparing for a national trade, but is concerned to know whether Pittsburgh basing has been eliminated permanently or whether later the steel companies may decide to fight the case through the courts. It is safe to say that the old method of reckoning prices will not soon reappear as an institution. The Steel Corporation is committed to the discontinuance of Pittsburgh basing in connection with sales at mills outside the Pittsburgh district, and competitive considerations will bring the independents in line with any new base prices that may be made by Steel Corporation subsidiaries. But this will not mean that a Southern buyer of steel may not pay considerably more than the Pittsburgh mill price for steel coming from an Atlanta or a Birmingham district mill. Our inquirer evidently has been counting on having prices at Chicago, Youngstown, Cleveland and Southern mills closely approximate those at Pittsburgh, under the ruling of the Federal Trade Commission. That, however, is not the case, and the Southern market, in particular, is likely to show under ordinary conditions prices that are considerably above those of Pittsburgh mills. From all that can be seen at the present time the new price régime does not promise to extend greatly, if at all, the markets of manufacturing consumers of steel.

New Books Received

The Mineral Industry—Its Statistics, Technology and Trade During 1923. Edited by G. A. Roush. McGraw-Hill Book Co., 370 Seventh Avenue, New York. Pages 887. Illustrated. Price, $12.

Structural Metallography. By H. B. Pulsifer. Pages 210. Illustrations 146. Published by Chemical Publishing Co., Easton, Pa. 1924.

Carnegie Scholarship Memoirs of the Iron and Steel Institute. Vol. xiii. Edited by George C. Lloyd. Pages 294, 5¼ x 8¼ in.; illustrations 11, charts and tables. Published by Spon & Chamberlain, 123 Liberty Street, New York.

Journal of the Iron and Steel Institute. Vol. clx. Edited by George C. Lloyd. Pages 679, 5¼ x 8¼ in.; illustrations 33, charts and tables. Published by Spon & Chamberlain, 123 Liberty Street, New York.

Transactions of the American Institute of Chemical Engineers. Vol. xv, Part 1. Pages 405, 6 x 9 in.; illustrations, charts and tables. Published by American Institute of Chemical Engineers, Polytechnic Institute, Brooklyn, N. Y.

A new edition of the Book of Standards of the American Society for Testing Materials will appear this year. The standards of the society now number 220, and the volume will have approximately 1150 pages. The society's 1924 year book, 334 pages, will come from the press shortly.

The members of the Electric Hoist Manufacturers' Association report an increase of 40.91 per cent in the number of hoists ordered in September as compared with August, and an increase of 41.64 per cent in the value of hoists ordered. Shipments in September increased 29.44 per cent over shipments in August.

Iron and Steel Markets

PRICE IRREGULARITIES

Operations Continue at the September Rate

Some Hesitancy, Apart from Railroad Buying —Freight Absorbed on Western Shipments

Leaving out railroad buying, which has been fairly well discounted by statements of the past few weeks, demand for the heavier steel products is inclined to lag. Quite generally steel companies have continued this month their September rate of operations, and little change is looked for in the few weeks just ahead.

Pre-election hesitancy is credited with some of the holding off on plates, shapes and bars, and price unsettlement, under sharper competition, is also a factor, but the main influence in the market is still the policy manufacturing consumers have followed for months of limiting buying to early needs.

The situation in the sheet, wire and pipe markets has turned on the continued effort of Western consumers to get their orders on the books of Chicago district mills. One sheet producer there is filled up for four to six weeks ahead. Just now sheet mills in Ohio are meeting the new Chicago zone prices, but when Chicago capacity is taken up, full freight will figure again in delivered prices.

Wire and pipe transactions in the West likewise show that Ohio and Pittsburgh mills are disposed for the time to hold their more distant trade, and irregularities in delivered prices show that there is quite a little groping in the effort to locate the market.

Pittsburgh mills have been able to get 2c. at mill for structural shapes consumed locally or shipped westward, but when they attempt to get business to the eastward must go as low as 1.90c. to compete with Eastern mills. There are similar discrepancies in delivered prices on steel bars.

Steel ingot production in September at a fraction over 63 per cent of capacity showed a better operation of independent plants than had been reported through the month, that being close to the percentage credited to the Steel Corporation.

Equally favorable was the September addition of 184,000 tons to the Steel Corporation's unfilled orders in view of its good rate of shipments. Last month's large tin plate contract for cans, good bookings of car and track steel, and the entering up in September of sheet bar contract tonnage for the fourth quarter were leading factors.

Increased steel operations in the Chicago district have caused the blowing in of an additional blast furnace at Gary and of one at South Chicago.

The distribution of the 150,000 tons of the New York Central rail order is practically made up, being roundly 67,500 tons to Bethlehem, 57,000 tons to the Illinois Steel Co., 13,500 tons to the Carnegie Steel Co. and 12,000 tons to the Inland Steel Co.

The Wabash has just placed 15,000 tons of rails for 1925 and the Erie will buy 8000 tons for its Western lines. A large order for tie plates, 9000 tons, has come from the Northern Pacific. While demand for track supplies has improved, prices are somewhat lower.

The Norfolk & Western is getting bids on 10,000 tons of shapes and plates for 1000 cars to be built in its own shops. The week's total of new cars ordered was 1050 and inquiries are out for 2440. Some recent figures of car orders placed and pending have outrun the facts.

Following the placing of round tonnages of pig iron by radiator, pump and textile machinery companies in the East, buying in that section is not now active and there is a dull market throughout the Central West. Prices are fairly well maintained, but efforts of sellers to obtain an advance of 50c. for delivery in the first quarter of 1925 meet with little success. Pig iron from India is being sold in moderate amounts at Eastern points, prices being close to a parity with the domestic market.

Small shipments of Belgian steel bars are coming into the Boston and Philadelphia districts for distribution through jobbers. Prices have ranged from 1.95c. to 2.05c., duty paid. A late export transaction is the sale of 20,000 boxes of tin plate wasters from a West Virginia mill to a British buyer.

Finished steel has fallen to 2.46c. per lb., in THE IRON AGE composite price, from 2.474c. last week. The new figure is the lowest in 21 months. Pig iron, on the other hand, has stood at $19.46 for nine successive weeks. One year ago it was $4.08 higher.

Pittsburgh

Steel Barely Holds Its Own—Various Explanations Given

PITTSBURGH, Oct. 14.—Steel business in this district possibly may be holding its own, but that is about the best construction that can be put upon the various reports from producers. There certainly has been no general increase in demand in the past week as compared with the week before. It may be that manufacturers in this district are suffering from the fact that consumers at distant points are seeking supplies from nearby mills. But that can hardly be the full story, in view of the fact that it is decidedly the exception rather than the rule for Pittsburgh manufacturers to surrender old accounts merely on the score of price.

Pittsburgh producers generally are equalizing

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 14, 1924	Oct. 2, 1924	Sept. 16, 1924	Oct. 16, 1923
No. 2X, Philadelphia‡	$21.76	$21.76	$21.76	$24.26
No. 2, Valley Furnace†	19.50	19.50	20.00	24.00
No. 2, Southern, Cin'ti†	21.55	21.55	21.55	24.05
No. 2, Birmingham, Ala.†	17.50	17.50	17.50	20.00
No. 2 foundry, Chicago*	20.50	20.50	20.50	25.00
Basic, del'd, eastern Pa.	20.00	20.00	20.00	24.50
Basic, Valley furnace	19.00	19.00	19.00	24.00
Valley Bessemer del. P'gh.	21.76	21.76	21.76	26.76
Malleable, Chicago*	20.50	20.50	20.50	25.00
Malleable, Valley	19.50	19.50	20.00	23.50
Gray forge, Pittsburgh	20.76	20.76	21.26	25.26
L. S. charcoal, Chicago	29.04	29.04	29.04	30.04
Ferromanganese, furnace	95.00	95.00	95.00	110.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	36.00	36.00	36.00	40.00
O.-h. billets, Pittsburgh	36.00	36.00	36.00	40.00
O.-h. sheet bars, P'gh	37.00	37.00	37.00	42.50
Forging billets, base, P'gh.	*41.00*	42.00	42.00	47.50
O.-h. billets, Phila.	41.17	41.17	42.17	45.17
Wire rods, Pittsburgh	46.00	46.00	46.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	2.40
Light rails at mill	1.85	1.85	1.85	2.25
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.32	2.32	2.32	2.67
Iron bars, Chicago	2.10	2.10	2.15	2.40
Steel bars, Pittsburgh	2.00	2.00	2.00	2.40
Steel bars, Chicago	2.00	2.00	2.00	2.50
Steel bars, New York	2.34	2.34	2.34	2.74
Tank plates, Pittsburgh	1.80	1.80	1.80	2.50
Tank plates, Chicago	2.00	2.00	2.10	2.60
Tank plates, New York	1.94	1.94	1.94	2.84
Beams, Pittsburgh	*1.90*	2.00	2.00	2.50
Beams, Chicago	2.00	2.00	2.10	2.60
Beams, New York	*2.19*	2.24	2.24	2.84
Steel hoops, Pittsburgh	2.50	2.50	2.60	3.15

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Oct. 14, 1924	Oct. 7, 1924	Sept. 16, 1924	Oct. 16, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.50	3.50	3.50	3.75
Sheets, black, No. 28, Ch'go dist. mill	3.60	3.60	...	...
Sheets, galv., No. 28, P'gh.	4.60	4.60	4.60	5.00
Sheets, galv., No. 28, Ch'go dist. mill	4.70	4.70	...	...
Sheets, blue, 9 & 10, P'gh.	2.70	2.70	2.70	3.00
Sheets, blue, 9 & 10, Ch'go dist. mill	2.80	2.80	...	...
Wire nails, Pittsburgh	2.75	2.75	2.80	3.00
Wire nails, Ch'go dist. mill	2.85	2.85	...	...
Plain wire, Pittsburgh	2.50	2.50	2.55	2.75
Plain wire, Ch'go dist. mill	2.60	2.60	...	...
Barbed wire, galv., P'gh.	3.45	3.45	3.50	3.80
Barber wire, galv., Ch'go dist. mill	3.55	3.55	...	...
Tin plate, 100 lb. box, P'gh.	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$18.00	$18.00	$18.50	$17.50
Carwheels, Philadelphia	17.50	17.50	18.00	20.00
Heavy steel scrap, P'gh.	*18.50*	18.00	19.00	16.00
Heavy steel scrap, Phila.	*16.50*	17.00	17.50	15.00
Heavy steel scrap, Ch'go	16.00	16.00	16.50	14.00
No. 1 cast' Pittsburgh	18.00	18.00	18.00	19.50
No. 1 cast, Philadelphia	17.50	17.50	18.00	19.50
No. 1 cast, Ch'go (net ton)	17.50	17.50	18.50	19.00
No. 1 RR. wrot. Phila.	18.50	18.50	19.00	17.50
No. 1 RR. wrot. Ch'go (net)	*14.00*	14.50	15.00	13.00
Coke, Connellsville:				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$3.75
Foundry coke, prompt	4.00	4.00	4.00	4.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.25	13.12½	13.50	13.12½
Electrolytic copper, refinery	13.00	12.75	13.00	12.62½
Zinc, St. Louis	6.30	6.20	6.25	6.30
Zinc, New York	6.65	6.55	6.60	6.65
Lead, St. Louis	7.82½	7.82½	7.95	6.60
Lead, New York	8.00	8.00	8.10	6.85
Tin (Straits), New York	50.25	49.62½	47.00	41.50
Antimony (Asiatic), N. Y.	11.00	11.00	11.00	7.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

THE IRON AGE Composite Prices

Oct. 14, 1924, Finished Steel, 2.460c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

Oct. 7, 1924,	2.474c.
Sept. 16, 1924,	2.481c.
Oct. 16, 1923,	2.775c.
10-year pre-war average,	1.689c.

Oct. 14, 1924, Pig Iron, $19.46 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

Oct. 7, 1924,	$19.46
Sept. 16, 1924,	19.46
Oct. 16, 1923,	23.54
10-year pre-war average,	15.72

1924 to Date High	1924 to Date Low		1923 High	1923 Low
2.789c., Jan. 15	2.460c., Oct. 14	Finished Steel	2.824c., April 24	2.446c., Jan. 2
$22.88, Feb. 26	$19.29, July 8	Pig Iron	$30.86, March 20	$20.77, Nov. 20

freights with their more favored competitors rather than lose customers. In that fashion the problem of the change from a Pittsburgh plus method of quoting to an f.o.b. mill or delivered price basis is being solved and the transition no longer can be held accountable for the lack of business. The close proximity of the election probably is the most plausible explanation for the failure of business to move upward.

Although there was considerable tendency on the part of independent producers to complain that the base prices on sheets and wire products established by the Steel Corporation "cut the cloth pretty tight," it is evident that this expression was coined before there was full consideration of the subject. A case in point is found in attempt of a sheet maker to secure some galvanized sheet business in the Chicago district at the price named by the leading producer of 4.70c., Chicago district mills, only to find that this price was about $4 a ton too high.

Evidently there are mills which can get into certain territories on wire products at prices that do not harmonize with the established base prices. The new order of things resulted, no doubt, in a good many variations in freight rate computations and the phrase now frequently encountered is "blind competition." With a sole basing point, manufacturers were able to figure out approximately delivered prices at all points of consumption, but it takes time for all manufacturers to become familiar with delivered prices at various destinations.

Quite apart from causes growing out of the abandonment of the Pittsburgh base, it may be said that there is still an insufficient amount of business to give the industry in all parts of the country a fair share, and competition for orders keeps prices favorable to buyers. Going west of Pittsburgh a short distance, Pittsburgh mills are able to get better prices than they can in going east. There is not enough structural steel business either here or immediately west of Pittsburgh, and to obtain orders east, mills have lately been obliged to go to 1.90c. Some black sheet business is going on independent mill books as low as 3.30c. base. Acute weakness still is noted in boiler tubes. The market still is unsettled on wide strips.

The pig iron market is dull almost to the point of stagnation. It is interesting, however, to note that the scrap market, which lately has been inclined toward weakness, has stiffened in the past week under fair sized purchases for delivery at Steubenville. Increased demand for coke and coal has been accompanied by increased production and prices are no stronger than they have been.

Pig Iron.—The local trade find it difficult to recall a quieter period than the past week has been. Only carload lots are being sold and these run almost entirely to foundry iron, there being practically no interest in the steel making grades. There seems to be a good movement against contracts, but not enough to absorb all of the production, and some increase still is going on in yard stocks. There has not been enough business to give basis for any change in prices. The furnace of the Clinton Iron & Steel Co., the only merchant stack in Pittsburgh, will be blown in late this week.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$19.00
Bessemer	20.00
Gray forge	$19.00 to 19.50
No. 2 foundry	19.50 to 20.00
No. 3 foundry	19.00 to 19.50
Malleable	19.50
Low phosphorus, copper free	27.00 to 28.00

Ferroalloys.—Outside of the advance of $5 per ton in the quotation on British ferromanganese, the market is without new features. Decision on the part of British producers to go to $100, c.i.f. Atlantic seaboard, duty paid, for ferromanganese is understood to have been preceded by the taking of considerable business at $95, and so far as is known there has been no business at the new quotation. Domestic material has been quoted for several weeks at $100, furnace, with freight equalized to destination with the seaboard, but no sales are noted at that price. Sales activities are restricted by the fact that consumers generally are well covered for the present quarter at low prices and are not interested just now in fresh supplies. About 500 tons of spiegeleisen has been sold in this district at $31, furnace, for 20 per cent material. There is almost no interest in 50 per cent ferrosilicon, which is quoted at $72 to $75, delivered East of the Mississippi River. Prices are given on page 1033.

Semi-Finished Steel.—With non-integrated producers of sheets, tin plate wire and pipe having an average operation of about 65 per cent, there is, of course, fairly good specifying against contracts for semi-finished steel, but it is chiefly against third quarter tonnages, since there has not been the usual amount of such business for the present quarter. Revisions in prices failed to bring in the specifications for all of the third quarter business placed and there are some companies which have stocks sufficient to meet pretty well the requirements of finished steel now in sight for this present quarter. Stocks in consumers' hands are high-priced as a rule and there has been a tendency to test the market out thoroughly before placing fourth quarter business, one thought being to get supplies cheaply enough to average down the cost. Open market activity is greater in wire rods than in other forms of semi-finished steel and in that product there is much price irregularity. The common quotation is $46, base, Pittsburgh or Cleveland, but there is not only the claim of buyers that they can buy at $45, but the admission of some producers that they have lost business at $46. This product is properly quotable at $45 to $46, Pittsburgh. Ingot production in this and nearby districts still averaging around 60 per cent of capacity, or about where it has been for the past two or three weeks. Prices are given on page 1033.

Wire Products.—Demand is steady rather than active, with both jobbers and manufacturing consumers coming in often for small lots instead of contracting ahead. There is sufficient business to keep the industry running steadily at about 60 to 65 per cent of capacity, but with buyers keeping their purchases within bound of early requirements there is not the assurance of sustained operations that comes with forward bookings. There continues to be some price cutting in coated nails, which lately have sold down to $2.10, base, per count keg, but otherwise, observance of quotations is as close as is possible in view of the fact that real familiarity with the new mode of quoting is not yet an established fact. Freight rates from the various points at which the leading interest has plants have yet to be thoroughly learned as well as what those mills do and do not produce. Prices are given on page 1032.

Steel Rails.—In this district, producers of billet light rails still are quoting 1.85c. to 1.90c., base, mill, but it is admitted that only small lots are being moved at those prices and that 1.80c. probably would be done on a fair-sized lot. There is only a moderate demand in spite of the improved operations of the coal mines in this part of the country. Prices are given on page 1032.

Tubular Goods.—General conditions are much as they have been for the past few weeks. Replenishment of stocks of merchant pipe by jobbers means a reasonably good business in that class of goods, but oil country goods are rarely active at this time of the year and this year is no exception. No important line pipe tonnages have been placed in the past week. Boiler tubes are as weak as ever in the scramble of a number of mills for a share in a business that is hardly sufficient to keep as much as half of the capacity engaged. It is reported that some makers of lapwelded steel tubes now are quoting 3-in. tubes at 49½ per cent off list in carloads, as against the card discount of 40 per cent, but the higher discount is merely 40 and 4 fives off list, which has been common for some time; indeed, 5 fives beyond the card have been quoted. On charcoal iron tubes 3 tens beyond the card now are offered. The recession from published prices on commercial seamless tubes on actual business is equal to the 5 fives beyond the card given on lapwelded steel tubes. Discounts are given on page 1032.

Iron and Steel Bars.—No very large tonnages of steel bars are being offered to the makers in this district, but there are a good many small lot requirements and on these the prevailing price is 2c. base, Pittsburgh district mills. Occasionally when the order runs to a large number of sizes, or when delivery must be made very promptly, a slight advance over this price is obtainable. Refined iron bars still are held at 2.90c. to 3c. base, Pittsburgh, but only small lots are moving at that price. Prices are given on page 1032.

Cold-Finished Steel Bars and Shafting.—Independent producers in this district are less seriously concerned over the basings at Cleveland and Worcester, Mass., than they were when these basings were first announced. It develops that the producer which set up these basing points does not make the full range of sizes at either plant and consequently there will not be the necessity of freight equalization to the extent that was at first feared. The common quotation of producers in this district remains at 2.70c., base, and one eastern Ohio producer still is quoting 2.70c., base, with Pittsburgh rate of freight. General business is fairly good, but it is no tax upon the capacity and since several automobile producers have found it impossible to attain their fourth quarter schedules, the idea is that business will not be greatly better in screw stock in

the next few weeks. Shafting business is light. Ground shafting holds at the recently established base of 3.10c., f.o.b. mill. Prices in all districts will be found on page 1032.

Track Supplies.—Aside from the fact that some local jobbing business in small spikes, which formerly went outside the district, now is coming to local makers, the situation is without new features. Real activity is lacking, but prices are holding fairly well at the lower levels recently named. Prices are given on page 1032.

Structural Material.—Pittsburgh mills still are quoting 2c., base, for large structural beams and are able to get that price locally or to the West, but find it necessary to go East to secure a sufficient amount of business to run economically and in that direction competition has forced them to go as low as 1.90c. to secure orders. Some of the fabricating companies report little more tendency on the part of investors to close and also that price competition on fabricated steel is not so sharp as it was recently. Plain material prices are given on page 1032.

Plates.—This product still is the weakest on the list. The country's consumption has not yet caught up with capacity and competition for business is sharp. There is not much local business and when Pittsburgh mills seek business outside of their natural territory they have to go pretty low to be successful. The local range still is 1.80c. to 1.90c. base, Pittsburgh district mills. Prices are given on page 1032.

Sheets.—Business so far this month does not show up so heavy as that for the same period last month, and it is doubtful if mill operations for this month will run as high as they did in September, when the industry as a whole averaged slightly above 70 per cent of capacity. Independent manufacturers have either adopted or are meeting American Sheet & Tin Plate Co. prices in Chicago, and many of them have gone onto a mill base method of quoting. While locally the market seems to be fairly well defined at quotations given on page 1033, there are reports that equivalent of 3.30c. Pittsburgh district mills is being done on black sheets by some outside mills and Chicago advices indicate that 4.70c., the Chicago mill base on galvanized sheets, is not the minimum on that grade. Detroit advices are that automobile manufacturers have not generally attained the schedules planned for this quarter of the year, and that their steel requirements will not be as heavy as indicated earlier. Prices are given on page 1033.

Tin Plate.—Business rarely is active at this time of the year and this year is no exception. The industry is occupied to the extent of slightly more than half of capacity in filling contract obligations. The price of $5.65 per base box delivered at Chicago is good only to the extent of the capacity of the Gary mills of the American Sheet & Tin Plate Co. so far as that company is concerned. Its base price at Elwood, Ind., is 5.60c and with a freight rate of 23½c. per 100 lb., the delivered price would be practically equal to $5.50 at Pittsburgh plus freight. While the Elwood mill probably will not ship into Chicago, consumers at points that will be served from this mill will pay practically the same prices they would if the material was shipped from Pittsburgh. The Jones & Laughlin Steel Corporation has a price of $5.70 per base box, Chicago.

Hot-Rolled Flats.—The market still is unsettled and indeterminate in the wider sizes because of competition from sheet and small plate mills with regular strip mills. Where base prices are observed, the range is somewhere from 2.25c. to 2.40c. Net prices still are being quoted and these figure out somewhat lower than the base prices. There is not quite the same amount of competition on the narrow material, particularly in the lighter gages, and prices in that direction are fairly steady. Prices are given on page 1032.

Cold-Rolled Strips.—Business is better with local producers and there is good observance of the regular quotation of 4c. base. At Pittsburgh district mills concessions from that price are confined entirely to equalization of prices with outside mills, but it is commented upon that this has not been necessary very frequently because a good many consumers are retaining old supply connections where the difference in delivered prices is not large.

Bolts, Nuts and Rivets.—Business is very quiet again with local producers due to the fact that buyers who specified very freely against unshipped third quarter business now are pretty well stocked. The test of present quotations still is ahead. Prices and discounts are given on page 1032.

Coke and Coal.—There seems to be a somewhat better outlet for furnace coke than was the case recently, but there is also an ample supply and prices are no stronger. Furnace coke for blast furnace use is readily obtainable at $3 per net ton at ovens for spot or prompt delivery and it is believed that supplies for shipment over the remainder of the year can be had at or near that price. Sales of furnace coke at a higher price usually are for some non-metallurgical use. Ordinary brands of foundry coke still are selling at $4 to $4.60 and as much as $1 a ton higher for choice brands. The coal market is fairly active, but supplies are still somewhat excessive and prices are weak. We quote mine run steam coal from $1.50 to $2.10 per net ton at mines; coking grade from $1.60 to $1.85, and gas coal from $2 to $2.25. Steam slack coal is selling right around $1 a ton and gas slack from $1.15 to $1.30.

Old Material.—Just as the market was giving signs of a weakness, it developed fresh strength on heavy melting grade as a result of a fair-sized purchase for Steubenville delivery. It is estimated that 5000 or 6000 tons was sold at $19, which compares with $17.50, about the best price that dealers could obtain on the small lots they had to move for shipment to other points in the district. What has occurred, however, represents no fundamental change in the situation, since there has been no heavy melting steel, except rejected lots, available at much under $18.50 at any time recently. Dealers short of the market have been willing to go that high to secure material that would pass inspection, and such material has not been coming out of dealers' yards at recent mill bids, while, as recently noted, railroad steel has brought $19. Other grades are holding at about recent quotations. The Baltimore & Ohio Railroad is taking bids until noon, Oct. 20, on 12,005 gross tons of scrap and there are 8192 gross tons in the Norfolk & Western list, which closes at noon Oct. 15.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel	$18.50 to $19.00
No. 1 cast, cupola size	18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.00 to 19.50
Compressed sheet steel	16.50 to 17.00
Bundled sheets, sides and ends	15.50 to 16.00
Railroad knuckles and couplers	21.00 to 21.50
Railroad coil and leaf spring	21.00 to 21.50
Low phosphorus blooms and billet ends	22.00 to 23.50
Low phosphorus plate and other material	22.00 to 22.50
Railroad malleable	16.50 to 17.00
Steel car axles	22.00 to 22.50
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	21.00 to 22.00
Machine shop turnings	14.50 to 15.00
Sheet bar crops	21.00 to 21.50
Heavy steel axle turnings	15.50 to 16.00
Short shoveling turnings	15.00
Heavy breakable cast	16.00 to 16.50
Stove plate	15.00 to 15.50
Cast iron borings	15.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	18.00 to 18.50

The first battery of new coke ovens contracted for in February last by the By-Products Coke Co., Syracuse, N. Y., will be fired on Nov. 1 and will begin production early in December. According to the present plans, a second battery will follow the first by about two weeks.

Chicago

Many Buyers Excepting Railroads Show a Tendency to Hesitate

CHICAGO, Oct. 14.—Railroad buying is the mainstay of the local steel market. Orders, placed with a local mill by railroad car builders since Sept. 1 exceed 150,000 tons. Purchases of rails and fastenings are also increasing. The Wabash has closed for 15,000 tons of rails and the Northern Pacific for 9000 tons of tie plates. The New York Central is at the point of distributing orders for 150,000 tons of rails and the Missouri, Pacific and the Kansas City Southern have entered the market for their 1925 requirements. Omitting the railroads from consideration, demand for the heavier products is showing a tendency to lag, no doubt reflecting the hesitancy of buyers pending the outcome of the Presidential election. The situation in sheets, wire products and pipe presents a different aspect accounted for, no doubt, by the desire of Western consumers to get their orders on the books of Western mills. The local independent sheet producer is now operating at capacity and is booked four to six weeks ahead. Although buyers have seen fit to order their needs from Chicago district mills to protect themselves from the necessity of buying from outside mills at the Pittsburgh base price plus the freight, it has developed that a considerable number of producers east of here are meeting the new Chicago zone prices in quoting their regular trade. They are by no means willing to accept all business offered them on this basis, however, and no doubt when satisfactory deliveries are no longer available from Western mills, they will find it unnecessary to continue the practice of absorbing freight into this territory. In fact, an examination of their cost sheets a month or two hence may demonstrate that freight absorption is not warranted even as a temporary policy.

Steel output in this district continues to improve. Through the blowing in of a stack at Gary and another at South Chicago, the number of active steel works blast furnaces have been increased to 19 out of 34. A large independent mill is now running at 75 to 80 per cent of capacity and another important producer is on a 62 per cent basis.

Ferroalloys.—Ferromanganese has generally advanced to $100, seaboard, but no sales have been reported at the new price. During the past two weeks, fully 4000 tons was bought in this district at $95, seaboard. Spiegeleisen is commonly quoted at $34, New Orleans.

We quote 80 per cent ferromanganese, $102.56 to $107.56, delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, $39.56, delivered.

Pig Iron.—Buying is extremely light and there is considerable speculation among melters as to whether an attractive tonnage could not be placed at less than the present market. Certain it is, however, that practically no business is being placed at more than $20.50, base furnace. The quotation of $21, base, local furnace, while still adhered to by one producer, is nominal so far as current transactions are concerned. On the other hand, a leading seller has advanced its price to $21, base furnace, for first quarter delivery as contrasted with fourth quarter shipment. This quotation is as yet untested. The most encouraging feature of the present situation is the fact that stocks on melters' yards are low. Furthermore melt in this district now averages fully 60 per cent as compared with a much smaller output during the summer. Buying, however, is not expected to revive until after the Presidential election. A Michigan melter is inquiring for 500 tons of foundry for fourth quarter. An inquiry in this district calls for 300 tons of foundry for first quarter. A local user has closed for 200 tons of Southern for the current quarter, and a Michigan melter has ordered 100 tons of Southern. An inquiry for a carload of low phosphorus is before the trade. Electric ferrosilicon, 14 to 16 per cent, has declined 50c. a ton on recent sales.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00
Malleable, not over 2.25 sil.	20.50
Basic	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	22.18
Southern No. 2, sil. 1.75 to 2.25	23.51 to 24.01
Low phos., sil. 1 to 2 per cent, copper free	31.79
Silvery, sil. 8 per cent	34.29 to 35.29
Electric ferrosilicon, 14 to 16 per cent	42.92

Plates.—A local mill's bookings of steel from car builders since Sept. 1 exceed 150,000 tons. During the past week, over 35,000 tons of car steel was placed with local mills. Orders for plates from tank fabricators are also liberal. While prices are gaining strength, they have not yet advanced.

The mill quotation is 2c. to 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Fabricating awards are fairly numerous involving a total of 7600 tons. Lettings by the Chicago & Northwestern and the Great Northern each entail approximately 1800 tons. An addition to the Clift Hotel, San Francisco, requires nearly 1600 tons. Among pending projects the South Water Street improvements, Chicago, 14,000 tons and the Eitel Brothers Building, Chicago, 6000 tons, are expected to be placed during the current week. Plain material prices are unchanged, although showing signs of greater firmness.

The mill quotation on plain material is 2c. to 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Wire Products.—Both jobbers and manufacturing buyers are ordering more freely, but are not yet finding it necessary to lay in heavy stocks in view of the comparatively early deliveries still available from the mills. The Colorado Fuel & Iron Co., like other Western independents, is understood to be meeting the Duluth and Chicago district mill prices in quoting its trade. The Colorado mill encounters the competition of Chicago district mills as it goes east for business and the competition of Southern and Eastern mills as it goes west. Shipment by water through the canal enables mills in the South and the East to sell on the Pacific Coast and to penetrate the interior for some distance toward the Rocky Mountains. Mill prices are shown on page 1032.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed, $3.05 per 100 lb.; common wire nails, $3.15 per 100 lb.; cement coated nails, $2.40 per keg.

Bars.—Demand for soft steel bars, while improving, is still limited largely to nearby requirements. Mill prices, which range from 2c. to 2.10c., are growing stronger. New business in bar iron shows little betterment with prices unchanged. Rail steel bookings show gradual improvement, but prices are weaker, concessions to 1.90c., Chicago district mill, being more frequent.

Mill prices are: Mild steel bars, 2c. to 2.10c.; common bar iron, 2.10c. to 2.15c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.10c. to 2.25c.

Rails and Track Supplies.—The Wabash has ordered 15,000 tons of rails for 1925 delivery, having placed 10,000 tons with the Illinois Steel Co. and 2500 tons each with the Inland Steel Co. and the Bethlehem Steel Co. The New York Central is expected to distribute orders today for 150,000 tons. The Erie will close soon for 8000 tons for its Western lines. The Kansas City Southern is inquiring for 2000 tons for 1925 delivery. The Missouri Pacific is in the market for a large ton-

nage for the same shipment. Additional releases against rail contracts have been received by the mills. Demand for track supplies has improved, but prices have declined somewhat. Tie plates are now quoted at $46 a net ton. The Northern Pacific has placed 9000 tons of tie plates, 700 tons of angle bars, 15,000 kegs of spikes and 8000 kegs of bolts. All of the angle bars, most of the spikes and 6000 tons of tie plates went to a local mill, while the bolts were ordered from the Bethlehem Steel Co.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 1.30c. to 1.90c., f.o.b. makers' mill.

Standard railroad spikes, 2.80c. mill; track bolts with square nuts, 3.80c. mill; steel tie plates, 2.30c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Bolts, Nuts and Rivets.—Railroads are commencing to contract for fourth quarter, but so far as can be learned, they have been unable to break the market. Specifications are heavier than is to be expected so early in a quarter, particularly after an advance in prices. Bolt and nut makers appear to be determined to hold strictly to their schedules. Small rivets are not so steady, as low as 70 and 10 and 5 off, Chicago, having been done. For prices see page 1032.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to ⅞ x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to ⅞ x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, $4 off; blank nuts, $4 off; coach or lag screws, gimlet points, square head, 65 per cent off.

Cast Iron Pipe.—The market is unusually quiet and prices, although unchanged, are not particularly strong. Lagrange Park, Ill., will take contractors' bids shortly on 700 tons of water pipe.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $54.20 to $55.20; 6-in. and over, $50.20 to $51.20; Class A and gas pipe, $5 extra.

Reinforcing Bars.—Keen competition has depressed prices to a point where they are unprofitable with a result that the attitude of concrete bar dealers is stiffening. Increasing evidences of greater firmness in mill prices are no doubt responsible for this change in policy. Sharp concessions in warehouse quotations have not entirely disappeared, but the view is gaining ground that it is no longer safe to predicate warehouse concessions on further expected declines in mill steel. Bids on a general contract for the first section of the South Water Street improvement, Chicago, will be taken Oct. 15, and more than 1000 tons of reinforcing will be involved. The entire project will require an aggregate of 7000 tons. General contract figures will be taken on a large amount of State road work Nov. 15, if a $100,000,000 bond issue passes in the coming election. Warehouse prices range from 2.10c. to 2.25c. Chicago.

Lettings include:

South Park Commissioners, Twenty-third Street viaduct over Illinois Central Railroad, 700 tons to Kalman Steel Co.

Washington Irving School building, Des Moines, Iowa, 300 tons to Concrete Steel Co.

Pending work includes:

John R. Thompson Building, 600 North Michigan Avenue, Chicago, 330 tons.

Grand-Revere Theater, Detroit, 150 tons.

Kinzie Street garage, Chicago, 300 tons, David S. Klafter, Chicago, architect.

Sheets.—Most of the Ohio mills are meeting the new Chicago and Chicago district prices in quoting to their regular trade. In the meantime, Western mills have been flooded with orders. The local independent is running full and is now committed four to six weeks ahead.

Chicago delivered prices from mill are 3.65c. for No. 28 black, 2.85c. for No. 10 blue annealed, 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

Steel Pipe.—Demand for standard pipe is in good volume and the Indiana Harbor and Evanston mills are comfortably booked. Additional capacity will come into production in this district during the coming winter. At the Gary Tube Co. plant now under construction at Gary, Ind., a lap weld furnace is expected to produce some time in November or December, while a butt weld furnace will probably be ready to start about the first of the year. The new butt weld plant of Clayton Mark & Co., this city, is also expected to be completed before the close of this quarter. For prices see page 1032.

Old Material.—Local tracks have been fairly well cleared of distress material, but hesitancy on the part of both dealers and consumers is slowing down trade. With election day so close at hand, the common impulse is to delay all except imperative purchases. In view of general inactivity, prices show little change, but these commodities which have figured in transactions have shown weakness. Railroad offerings include the Baltimore & Ohio, 12,000 tons; the Chesapeake & Ohio, 12,000 tons; the Santa Fe, 3400 tons; the Northern Pacific, 1750 tons; the Grand Trunk, 700 tons; the Soo Line, 650 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$18.00 to $18.50
Cast iron car wheels	18.00 to 18.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	18.50 to 19.00
Railroad tires, charging box size	18.50 to 19.00
Railroad leaf springs, cut apart	18.50 to 19.00
Rails for rolling	17.00 to 17.50
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	16.00 to 16.50
Frogs, switches and guards cut apart	16.00 to 16.50
Shoveling steel	15.75 to 16.25
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	13.00 to 13.50
Axle turnings	13.50 to 14.00
Steel angle bars	17.00 to 17.50
Steel knuckles and couplers	18.50 to 19.00
Coil springs	19.00 to 19.50
Low phos. punchings	17.00 to 17.50
Machine shop turnings	9.00 to 9.50
Cast borings	11.50 to 12.00
Short shoveling turnings	11.50 to 12.00
Railroad malleable	18.00 to 18.50
Agricultural malleable	17.00 to 17.50
Per Net Ton	
Iron angle and splice bars	16.50 to 17.00
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	24.00 to 24.50
Steel car axles	17.50 to 18.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	8.50 to 9.00
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	14.00 to 14.50
No. 2 railroad wrought	14.25 to 14.75
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	16.00 to 16.50
No. 1 agricultural cast	16.00 to 16.50
Locomotive tires, smooth	16.50 to 17.00
Stove plate	14.50 to 15.00
Grate bars	14.50 to 15.00
Brake shoes	14.50 to 15.00

Canadian Scrap Market—Plant Activities Increase

TORONTO, ONT., Oct. 6.—Following the slump in demand for iron and steel scrap around the middle of last month, trading is now gaining a stronger footing and orders for spot and future delivery are appearing more freely. While some of the larger melters have contracted for last quarter requirements, others adhere to the hand-to-mouth buying policy and it is the latter who are furnishing the greater part of the present demand for old material. Production activities among foundries have improved during the past month or six weeks, resulting in a larger daily melt than formerly. Foundry improvement has brought with it a strengthening in the demand for machinery cast, malleable scrap and car wheels and it is stated that foundry consumers who allowed their scrap holdings to practically disappear during the quiet months of this year are now anxious to replenish these. Mill activities are also improving.

	Toronto	Montreal
Gross Tons		
Steel turnings	$9.00	$8.00
Machine shop turnings	9.00	7.00
Wrought pipe	6.00	7.00
No. 1 wrought scrap	12.00	12.00
Heavy melting steel	11.00	10.50
Steel axles	16.00	19.00
Axles, wrought iron	19.00	20.00
Net Tons		
Standard car wheels	16.00	17.00
Malleable scrap	14.00	15.00
Stove plate	14.00	13.00
No. 1 machinery cast	18.00	18.00

New York

New York Central Rail Order About to Be Placed—Moderate Pig Iron Buying

NEW YORK, Oct. 14.—Sales in this territory in the past week amounted to about 20,000 tons, the principal purchases being 4785 tons by the Worthington Pump & Machinery Corporation and 6050 tons by the American Radiator Co. It is understood that on these large purchases recent quotations were shaded, but this would be difficult to do on anything but the most desirable business. On ordinary tonnages the market quotations are steady and usually 50c. more is asked for first quarter than for the remainder of this year. A feature of the situation is that numerous inquiries for small tonnages for prompt delivery and the rest of this year are being received, indicating that foundries have limited stocks. No large inquiries are pending. Imports of pig iron from India to the United States in August amounted to 9644 tons and it is likely that the tonnage for September was somewhat larger, but figures for that month are not yet available.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	$22.27 to $22.77
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.27 to 23.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.77 to 23.27
Buffalo, sil. 1.75 to 2.25	23.41 to 23.91
No. 2 Virginia, sil. 1.75 to 2.25	29.94 to 30.44

Ferroalloys.—Agents of British producers of ferromanganese have received notice of an advance in the price, effective at once, to $100 per ton, duty paid, Atlantic seaboard. The principal domestic producer has been quoting this price for the past few weeks.

Warehouse Business.—Although there are various signs of weakness in many products, no changes of schedule are reported. The black sheet market continues extremely weak and there are occasional reports of price shading on bar orders. There is practically no demand for plates. Galvanized sheets are holding quite firmly at 4.60c. to 4.75c. per lb. base. Demand for small lots of structural material continues fair. A slight downward revision of prices on some products seems to be expected by buyers, but sellers point out that elimination of the Pittsburgh base has not affected the cost of steel in the New York district. Sellers of wrought iron and steel pipe expect a change in discounts before long. We quote prices on page 1046.

Cast-Iron Pipe.—Business continues in fair volume with a few municipal awards still being made. The Department of Water Supply, Gas and Electricity, City of New York, has opened bids on part of the pending contracts involving water pipe and awarded work calling for 800 lengths of 8-in. pipe to the Melrose Construction Co., New York. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $56.60 to $57.60; 4-in. and 5-in., $61.60 to $62.60; 3-in., $71.60 to $72.60, with $5 additional for Class A and gas pipe. Shading of prices in the soil pipe market has resulted in a new schedule of discounts to which makers are endeavoring to adhere. The present discounts represent a decline of about $2 per ton from the former schedule. We quote discounts of both Northern and Southern makers, f.o.b. New York, as follows: 6-in., 47½ to 48¼ per cent off list; heavy, 57½ to 58¼ per cent off list.

Finished Iron and Steel.—The outstanding steel tonnage is 150,000 tons of rails, which will probably be distributed this week by the New York Central Railroad. Distribution will probably be about the same as that of the 150,000 tons bought in June, 1923, when it was divided as follows: Bethlehem Steel Corporation, 67,500 tons; Illinois Steel Co., 57,100 tons; Carnegie Steel Co., 13,350 tons; Inland Steel Co., 12,050 tons. No other important steel buying is in prospect, and there has been a falling off this week even in structural jobs, which in previous weeks have been holding up pretty well for this season. Buying of miscellaneous steel products by manufacturers and jobbers is no less in volume and in some products, notably tin plate and pipe, there is a fairly important gain. One order for 50,000 boxes of tin plate brought up the week's total considerably, but there is good general buying by all tin plate users. Steel bars are in fairly good demand, but shapes are less active and plates continue dull. On steel bars there are apparently no concessions from 2c., Pittsburgh, except possibly on concrete reinforcing bars. Shapes are quoted from 1.80c. to 1.90c., Pittsburgh, the lower figure obtaining only on very attractive lots. Plates range from 1.60c. to 1.65c., Pittsburgh.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 1.94c. to 1.99c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.34c.

Coke.—There is moderate activity but prices continue weak. Standard foundry is holding at $4.25 to $4.75 per ton and standard furnace at $3.25 to $3.50 per ton with some distress tonnages of furnace available at as low as $3.10 per ton. By-product is unchanged at $10.41, Newark and Jersey City, N. J.

Old Material.—Weakness is slightly more pronounced on some grades. No. 1 heavy melting steel is quotable at from $16 to $17, delivered eastern Pennsylvania consumers, the latter price prevailing in the case of shipments to Claymont, Del. On shipments to Conshohocken, Pa., brokers are paying $16.50 per ton delivered, and this is also generally paid for shipment to Bethlehem, Pa. A few brokers, not filling contracts, and anticipating further weakness are offering only $16 per ton for Bethlehem and the few lots going to a consumer at Sparrows Point, Md., from this district bring only $16 per ton. Borings and turnings are off 50c., brokers offering only $12 to $12.50 per ton delivered to Bethlehem. Shipments to a New Jersey consumer of stove plate are only bringing $14 to $14.25 per ton, while $15 delivered Harrisburg and $15.50 delivered Phoenixville are the prevailing prices paid by eastern Pennsylvania consumers. Specification pipe is quoted at $16 to $16.50 per ton delivered eastern Pennsylvania.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$12.25 to $12.75
Heavy melting steel, railroad or equivalent	13.25 to 13.75
Rails for rolling	14.50 to 15.00
Relaying rails, nominal	24.00 to 25.00
Steel car axles	19.00 to 19.50
Iron car axles	26.00 to 28.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (clean)	9.75 to 10.25
Machine shop turnings	9.75 to 10.25
Mixed borings and turnings	9.50 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	12.25 to 12.75
Stove plate	11.25 to 12.25
Locomotive grate bars	11.50 to 12.50
Malleable cast (railroad)	14.00 to 14.50
Cast iron car wheels	14.50 to 15.00
No. 1 heavy breakable cast	12.00 to 12.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$16.00 to $16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.)	13.00 to 13.50

Youngstown Scrap Market

YOUNGSTOWN, Oct. 14.—Buying of steel scrap has reached low proportions in this district, with the market pegged at $18 on heavy melting. A prominent buying interest expresses the belief that he could purchase heavy melting below $18, for the time being, admitting however, that the market is quickly susceptible to buying influences. Dealers, too, have apparently withdrawn from the market temporarily, as they see no immediate needs of any consequence to fill. What little buying is being done is confined to small-lot tonnages.

Newspaper reports that the United States Steel Corporation through one of its subsidiaries is preparing to begin the construction of two large sheet and tin plate mills in Duluth, Minn., and that plans have already been approved by the finance committee could not be verified at the offices of the Steel Corporation. Judge Gary, when asked about the matter, replied that he had nothing to say.

Buffalo

Buyers of Pig Iron Sounding the Market for First Quarter

BUFFALO, Oct. 14.—First quarter inquiry for pig iron has made its appearance and melters are testing the market. One maker posts a tentative base of $20 on this business. This same interest states that this base ($20) likewise prevails on iron for shipment through October and possibly part of November. On December iron it is said that $19.50 would probably be done. In spite of this show of strength by one interest, it is believed that iron in sufficient tonnage could probably be placed here at $19. The inquiry for the week is between 10,000 and 15,000 tons, mostly for foundry iron. This aggregate includes a 1000 ton inquiry from New England; 1000 tons from Baltimore; 1000 tons from eastern New York, and a western New York inquiry for 1500 tons. The latter business went to a Buffalo maker. A large melter is out for 6000 tons of iron for a New Jersey plant, but this iron will not come to Buffalo and nothing official is known of the inquiry. The malleable inquiry shows nothing very startling, one for 300 tons and another for 200 tons figuring. The iron for the local plant of the Worthington company, 2650 tons, is said to have been placed with a local maker, and the Eastern Malleable Iron Co., which was in the market for 1000 to 1500 tons of high silicon foundry, is said to have placed its order. One local maker booked 12,000 tons as its share of the past week's business.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$18.50 to $19.00
No. 1 foundry, sil. 2.75 to 3.25	20.00 to 21.00
No. 2 foundry, sil. 2.25 to 2.75	19.00 to 19.50
Malleable, sil. up to 2.25	19.00 to 19.50
Basic	19.00 to 19.50
Lake Superior charcoal	29.28

Old Material.—Very little buying is being done at this time, even the dealers having ceased their purchasing, comparatively speaking. They are picking up a little heavy melting steel for which they are willing to pay $16.50 to $17, and they are also getting some hydraulic compressed sheets for which they are willing to pay about $16. The lull has affected all the local consumers of scrap material, and dealers believe that this period may last till after election. One mill which last week was buying a little heavy melting steel paid $17, and for hydraulic compressed, $16. No. 1 machinery cast is very inactive, but stove plate is showing a more improved status. One local consumer is buying this material at $16.50. Mill operations continue around 60 per cent, with prospects of even better pace.

We quote f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	$16.50 to $17.50
Low phosphorus, 0.04 and under	19.50 to 20.00
No. 1 railroad wrought	15.00 to 15.50
Car wheels	15.50 to 16.00
Machine shop turnings	11.50 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00
Bundled sheets	12.00 to 12.50
Hydraulic compressed	15.50 to 16.50
Railroad malleable	17.00 to 17.50
No. 1 machinery cast	17.00 to 17.50

Finished Iron and Steel.—Business has picked up considerably, with inquiries for bar material the best in three weeks. Most of the commitment is carload orders. Sheet business is fair, with the going price for black, 3.50c., Pittsburgh, though three smaller mills have made lower prices. The galvanized price is 4.60c. One of the low quotations on black sheets was 3.40c. Shapes are being sold at 2.265 to 2.365c., Buffalo. Specifications on tin plate are coming in right along to sales agencies for makers. First half buying will not take place till later, and all users seem to be covered on the last half. A slight falling off is noticeable in fabricated structural business, with no outstanding inquiries or business. Canadian business is not very much better, though an improved demand for shapes is noticed. Bolt makers are inclined to stand firm on their prices and buyers are reaching the conclusion that the figure cannot be bettered. This is believed to be the reaction of the bolt makers to a long period of price cutting. The general tenor of comment on the Pittsburgh basing price change is that it will not mean much change in the Buffalo situation.

Steel bars, 3.30c.; iron bars, 3.35c.; reinforcing bars, 3.30c.; structural shapes, 3.40c.; plates, 3.40c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.85c.; bands, 4.05c.; hoops, 4.40c.; cold finished rounds, 4.20c.; cold-finished shapes, 4.70c.

Birmingham

Pig Iron Sales Small—Better Understanding as to Quotations on Finished Products

BIRMINGHAM, ALA., Oct. 14.—Sales of pig iron in the Birmingham district continue in small lots and not so active as they have been. The aggregate tonnage sold recently will equal the make, if not a little better. Reports are again heard that some sales have been made as low as $17.50 per ton but general denial is made. The smaller furnace interests assert that their sales are being made on an $18.50 per ton base. The Alabama Co., with machine cast iron, is holding to $18.50 per ton for No. 2 foundry, while other smaller interests are not booking business at a lower price. Inquiries have been slowing down since the first of the month. Sales of iron previously reported call for a large tonnage and in several instances consumers are manifesting interest in delivery.

We quote per gross ton, f.o.b. Birmingham district furnace, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$17.50 to $18.00
No. 1 foundry, 2.25 to 2.75 sil.	18.00 to 18.50
Basic	18.50 to 19.00
Charcoal, warm blast	30.00 to 31.00

Finished Material.—The disturbed feeling in the steel market in this section by reason of uncertainty as to prices on a Birmingham base, following the Pittsburgh plus elimination, is beginning to ease up as a better understanding is visible. Steel wire prices were first announced on a Fairfield basis, (just outside Birmingham's city limits), while bars, angles and tank plates have made very little change in 60 days. Steel fabricating plants have a fair amount of work on hand and see prospects of considerable business. Practically all of the larger buildings under way in this district or being planned now are of concrete construction but are requiring more or less steel, and those plants producing concrete steel bars report a steady demand. Soft steel bars are quoted at 2.10c. to 2.20c., Birmingham.

Pipe.—Lowering of cast iron pipe quotations is not given as the cause for the steady demand for the product. The expectation now is that the several plants in this territory will have reason for activity through the entire winter. Shipments of gas and water pipe continue at the same pace as the production. Four-inch pipe is quoted at $48 to $49; 6-in. pipe at $44 to $45.

Coke.—The Southern coke market still lags and quotations are weak, with no indications of an early recovery. Quotations for coke range from $4 to $5 with a little of the foundry, high-grade by-product coke selling at $5.25. The average is around $5.

Old Material.—The old material market in the South is quiet and the steel market situation is pointed to as the principal reason for this condition. Heavy melting steel has weakened again and is now quoted as low as $12. No speculation is being attempted.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	12.00 to 12.50
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	12.50 to 13.00
No. 1 cast	14.00 to 15.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plate	13.50 to 14.00
Machine shop turnings	6.00 to 7.00
Cast iron borings	7.00 to 8.00
Rails for rolling	15.00 to 16.00

Boston

Most Furnaces Holding Prices, but Concessions Are Made by Some

BOSTON, Oct. 14.—With the Draper Co., Hopedale, Mass., covered on 8000 to 10,000 tons of pig iron, the market has quieted down once more. Current business largely represents the tucking in of small tonnages by foundries to balance up stocks prior to winter. Increased production reported by some melters is offset by a falling off elsewhere, consequently the aggregate New England melt stays just about stationary. Most furnaces are holding to scheduled prices, but concessions have been made by certain Buffalo and eastern Pennsylvania interests, which gives the market an unsettled appearance. It is generally conceded among brokers that the Draper Co. bought Buffalo No. 2X at $18.50 furnace, and eastern Pennsylvania at $20. Eastern Pennsylvania No. 2X was offered in Connecticut the past week, even on small tonnages, at $20, and No. 1X at $21, and Buffalo No. 2X at $19. On the other hand one Buffalo furnace has advanced 50c. a ton on October deliveries to $20, $20.50 and $21.50, for No. 2 plain, No. 2X and No. 1X, respectively, and is holding firmly at $19.50 base for November and December shipment. A northern New England melter has just bought 400 tons eastern Pennsylvania silicon 3.00 to 3.25, November and December shipment, at around $25 delivered, which figures out at $20.50 furnace base. A textile machinery maker in the market for 1000 tons No. 2X at a price, has received no bid attractive enough to warrant purchase. A heater manufacturer will, it is believed, be in the market shortly for 4000 to 5000 tons No. 2 plain. A few small inquiries are in hand for first quarter shipment.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$23.65 to $25.15
East. Penn., sil. 2.25 to 2.75	24.15 to 25.15
Buffalo, sil. 1.75 to 2.25	23.91 to 24.41
Buffalo, sil. 2.25 to 2.75	24.41 to 24.91
Virginia, sil. 1.75 to 2.25	29.42 to 29.92
Virginia, sil. 2.25 to 2.75	29.92 to 30.42
Alabama, sil. 1.75 to 2.25	27.10 to 27.60
Alabama, sil. 2.25 to 2.75	27.60 to 28.10

Old Material.—A further shrinkage in old material business is reported among dealers in general. Less heavy melting steel is believed to have changed hands the past week than in any similar period in the present buying movement. Dealers have orders for such material at $12 to $12.50 on cars, but little is coming on the market, owners holding out for higher prices. Similar trade conditions as regard various other scrap are noted, which in a large measure accounts for the present inactivity. Chemical borings are selling moderately freely at $11.50 to $12 on cars, and machine shop turnings at $9 to $9.50. No. 1 machinery cast is moving, mostly at $19 delivered in New England. The 700 tons rerolling 80 to 110 lb. rails included in recent offerings by the Boston & Albany Railroad fetched better than $14.25 f.o.b. cars, at least 25c. a ton better than the local market will stand. Other material sold by the road also brought good prices.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$18.00 to $19.00
No. 2 machinery cast	15.00 to 16.00
Stove plates	14.00 to 14.50
Railroad malleable	17.00 to 17.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.00 to $12.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long)	11.50 to 12.00
Machine shop turnings	9.00 to 9.50
Cast iron borings, chemical	11.50 to 12.00
Cast iron borings, rolling mill	9.00 to 9.25
Blast furnace borings and turnings	9.00 to 9.25
Forged scrap and bundled skeleton	9.00 to 9.50
Shafting	18.00 to 19.00
Street car axles	18.00 to 19.00
Rails for rolling	13.50 to 14.00

Coke.—The movement of by-product from New England ovens to foundries is holding up well. Specifications against contracts for current consumption show comparatively little increase, the larger shipments being due to a desire on the part of some foundries to stock up for winter. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-product fuel at $11.50 a ton delivered in New England. It is generally believed that price will prevail the remainder of 1924, unless there is an unexpected improvement in general industry and a consequent increased demand for bituminous at higher prices.

St. Louis

Round Tonnage of Basic Pig Iron Sold—Better Demand for Coke

ST. LOUIS, Oct. 14.—The principal transaction of the week in pig iron was the sale of 4500 tons of basic to a St. Louis melter for October and November delivery by the St. Louis Coke & Iron Co., which also sold about 2000 tons of foundry grades, ranging from carloads to 500 tons. The first substantial inquiry in this section for first quarter delivery came from a central Illinois melter for 3500 to 4000 tons of foundry iron. Neither makers nor melters seem eager to make contracts now for first quarter. Conditions as far as melters are concerned are spotted. Some of the larger foundries are busy, while the smaller ones are just "getting by." Plants which cater to the railroads are busiest. The stove foundries in the district are doing better than they have been, but they are still operating far from capacity. Prices are nominally unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$23.16
Northern malleable, sil. 1.75 to 2.25	23.16
Basic	23.16
Southern fdy., sil. 1.75 to 2.25 (rail)	$23.17 to 23.67
Southern fdy., sil. 1.75 to 2.25 (rail and water)	21.28 to 21.78
Granite City iron, sil. 1.75 to 2.25	22.31 to 22.81

Ferroalloys.—The demand for ferroalloys in this district is only fair. Ferromanganese has advanced $5 to $106.89, St. Louis, an Illinois melter buying 100 tons before the advance. A Joplin concern bought 100 tons of spiegeleisen.

Finished Iron and Steel.—A permit has been issued for the $5,000,000 office building of the Southwestern Bell Telephone Co., and it is expected that the plans will be ready for contractors about Nov. 15. It is estimated that between 7000 and 8000 tons of structural steel will be required. Business in all lines is quiet. Orders are for small tonnages. Structural steel is in fair demand in lots of from carloads to 100 tons. There is an improved call for sheets—principally roofing—in carload lots. New railroad inquiries are for small amounts.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, $\frac{7}{8}$-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40 and 5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, $3.50 off list.

Coke.—There is a better demand for foundry coke, and consumers are urging shipments against contracts. Although the weather is still warm, dealers are taking more interest in domestic grades and a better movement is reported.

Old Material.—Further declines are reported in the market for old material this week. The declines range from 25c. to $1.50 a ton, and nearly the whole list is affected. Consumers in the district admit they are busy, but they say that they have sufficient material to take care of orders, and they will not buy now. There have been some distressed cars, which have helped to weaken the market. New lists issued during the week include: Wabash Railway, 8400 tons; Kansas City Southern, 350

tons; Southern Railway subsidiaries, 125 tons, and Missouri-Kansas-Texas, 1400 tons, including 300 tons of rails.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$16.00 to $16.50
Rails for rolling	16.25 to 16.75
Steel rails less than 3 ft.	18.50 to 19.00
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	16.00 to 16.50
Heavy melting steel	14.50 to 15.00
Heavy shoveling steel	14.50 to 15.00
Frogs, switches and guards cut apart	15.75 to 16.25
Railroad springs	18.00 to 18.50
Heavy axles and tire turnings	12.00 to 12.50
No. 1 locomotive tires	16.00 to 16.50
Per Net Ton	
Steel angle bars	14.50 to 15.00
Steel car axles	19.00 to 19.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	18.25 to 18.75
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	12.75 to 13.25
Cast iron borings	10.50 to 11.00
No. 1 busheling	13.00 to 13.50
No. 1 railroad cast	17.00 to 17.50
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	13.00 to 13.50
Machine shop turnings	7.00 to 7.50
Champion bundled sheets	8.00 to 8.50

Cincinnati

Pump Company Buys Pig Iron—Little Interest in Southern Grades

CINCINNATI, Oct. 14.—The only sale of pig iron of importance was approximately 1700 tons of foundry and Bessemer irons to the Worthington Pump & Machinery Corporation for its Cincinnati plant. The iron was divided between two producers, at $20, Ironton, for last quarter and $20.50, Ironton, for first quarter. These prices are being maintained in this district. In the Southern market the range continues from $17.50 to $18, with one furnace asking $18.50. Very little interest is being shown in Southern iron for first quarter and producers have not as yet named prices for this delivery. Sales generally are of single carloads for fill-in purposes, and it is expected that this condition will continue until at least after election day. In some districts the melt is increasing slowly, but generally little change in foundry operations is noted. Inquiry is light, the only one of consequence being for 500 tons for a pipe manufacturer.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	$21.55 to $22.05
Southern fdy., sil. 2.25 to 2.75	22.05 to 22.55
Southern Ohio silvery, 8 per cent	31.77
Southern Ohio fdy., sil. 1.75 to 2.25	22.27
Southern Ohio, basic	21.77
Southern Ohio malleable	22.27

Sheets.—Orders are not so numerous as they were, and prices are being cut $1 to $2 per ton. While the regular quotations seem to be 2.60c. for blue annealed, 3.50c. for black and 4.50c. for galvanized sheets, f.o.b. Pittsburgh, some orders were placed last week with the smaller mills at $2 per ton under these figures. Tin plate, in fair demand, is firm at $5.50 per base box, Pittsburgh.

Structural Activity.—There is no activity to speak of at present, most of the jobs being for less than 100 tons. A garage building at Columbus will require 800 tons, and the Big Four Railroad is in the market for 200 tons for turntables and girder spans. The only important award was for 400 tons for an addition to the Bedford Stone Co.'s plant at Bedford, Ind.

Reinforcing Bars.—A cement plant near Dayton, Ohio, will require approximately 1500 tons, and there are numerous other small jobs which make a fair aggregate tonnage. Awards are expected this week on the Scioto County Court House, 250 tons, and the Marietta High School, 250 tons. Projects in contemplation, but on which bids have not been asked, aggregate 6000 tons. Prices are fairly steady at 1.90c., mill, for hard steel bars, to 2c., mill, for new billet steel.

Warehouse Business.—Local jobbers report the number of small orders steadily increasing, and the first half of October has been the best of any similar period this year. All classes of materials are in demand, and prices are steady, with little chance of a change being made in the near future.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, 3.30c.; common wire nails, $3.30 per keg base; cement coated nails, $3 per keg.

Finished Materials.—The market is showing a slow but steady improvement, orders running from carloads to 100 tons. Plate business has been a little in advance of other products, but no large tonnages are being ordered. Prices generally are still quoted on Chicago and Pittsburgh bases, depending on ultimate destination, but invoicing usually carries the mill price with actual freight to destination. So far there has been no announcement by mills in this district as to any changes in method of quoting prices, and to all intents and purposes the old order stands. It is reported that some fourth quarter contracts have been made for plates on a basis of 1.85c., Pittsburgh, but the general asking price is 1.90c., Pittsburgh, and the larger independent mills are holding this price firmly on current business. Reports are also current of 1.90c. on shapes, but more business is being placed at 2c., Pittsburgh, than at the lower figure. Bars are steady at 2c., Chicago and Pittsburgh. There has been some shading of wire nails and wire products, and the $2.75 price established at Pittsburgh and Cleveland is being shaded 5c. per keg by some independents. Southern Ohio mills are quoting $2.50 mill for plain wire and $2.75 mill for wire nails, with a freight into Cincinnati of 14c. per 100 lb., and mills in other sections are equalizing the freight rate to this point. There has been little activity in light rails, and prices are nominally quoted at 1.80c. to 1.90c., mill. Track accessories are not in demand.

Coke.—Foundry and furnace grades continue dull, but domestic cokes are in slightly improved demand. Prices are fairly steady and unchanged.

Connellsville furnace, $3; foundry, $4.50 to $5.50; New River foundry, $8.50 to $9; Wise County furnace, $3.75; foundry, $4.50 to $5.50; by-product foundry, $6.50, Connellsville basis.

Old Material.—There was a slightly improved inquiry for old materials, particularly for foundry grades, but the situation is still rather mixed. Some grades for which there is an improved demand are higher, but others are lower. Not much business is looked for in the immediate future, both buyers and sellers being content to await developments.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$13.00 to $13.50
Scrap rails for melting	12.00 to 12.50
Short rails	16.00 to 16.50
Relaying rails	28.50 to 29.00
Rails for rolling	14.00 to 14.50
Old car wheels	13.00 to 13.50
No. 1 locomotive tires	14.50 to 15.00
Railroad malleable	14.50 to 15.00
Agricultural malleable	13.00 to 13.50
Loose sheet clippings	9.50 to 10.00
Champion bundled sheets	10.50 to 11.00
Per Net Ton	
Cast iron borings	9.00 to 10.00
Machine shop turnings	8.50 to 9.00
No. 1 machinery cast	17.50 to 18.00
No. 1 railroad cast	15.00 to 15.50
Iron axles	20.50 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Pipes and flues	7.00 to 7.50
No. 1 busheling	9.50 to 10.00
Mixed busheling	7.50 to 8.00
Burnt cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Brake shoes	11.00 to 11.50

An invitation conference on Employee Representation will be held at the Hotel Winton, Cleveland, Nov. 13 and 14. The speakers will include Hal S. Ray, director Personnel and Public Relations, Chicago, Rock Island & Pacific Railway, A. H. Lichty, vice-president Colorado Fuel & Iron Co., and Dr. C. A. Eaton, manager Industrial Relations Department, National Lamp Works.

Cleveland

Moderate Volume of Steel Business, with Keen Competition

CLEVELAND, Oct. 14.—The volume of steel business is only moderate, being about the same as during the recent weeks, although some of the independent mills that suffered a falling off in orders when the Pittsburgh plus method of quoting was abandoned report some gain in business. A fair demand has sprung up from jobbers who are replenishing their stocks, mostly in steel bars, and some consumers are buying for stock more freely. There are few new developments in the basing point situation further than that some of the methods of quoting prices adopted after the partial elimination of the Pittsburgh base have become more general. On steel bars, the Pittsburgh basing point is now practically eliminated. Mills generally are quoting delivered prices that frequently, after figuring back, are below the commonly quoted 2c. Pittsburgh base. Competition is unusually keen and mills are naming prices which they think will take the business. Independent plate mills are also quoting delivered prices. These, as a rule, but not always, are based on a Pittsburgh price. Local plate mills are confident that they will get some business in the Chicago territory without having to meet the prices of Chicago district mills when the latter get filled up and are unable to make prompt deliveries. In fact, a Cleveland mill during the week took some business in the Chicago territory without absorbing all the freight differential, being given the order because it was able to make delivery in one week. On light plate, local mills feel that they will be able to absorb the 30c. freight differential by naming 2.55c., Cleveland, for No. 10 gage to meet the 2.85c., Chicago, blue annealed price. Ohio sheet mills are holding pretty generally to the ruling quotations and while most of these are now adhering to the Pittsburgh base, such concessions as are being made are usually granted by absorbing some of the freight rather than cutting the base price. Structural steel is still holding to Pittsburgh base plus freight to the destination.

Iron Ore.—A few small lot sales are reported, the largest being 7000 tons of silicious ore. Very little additional demand is expected before the closing of the season in navigation. Stocks of Lake Superior ore on Lake Erie docks Oct. 1 were 7,704,919 gross tons as compared with 6,454,724 tons on Sept. 1 and with 7,019,718 on Oct. 1 of last year. Receipts at Lake Erie ports during September were 4,888,303 tons and for the season until Oct. 1, 25,095,647 tons as compared with 33,577,075 tons during the corresponding period last year. Lake Erie docks shipped 2,834,418 tons during the month. Shipments from these docks for the season until Oct. 1 were 18,106,332 tons as compared with 26,383,339 tons during the corresponding period last year. Receipts until Oct. 1 at other than Lake Erie ports were 8,738,077 tons as compared with 10,665,051 tons during the same period a year ago.

Pig Iron.—The market is dull. One producer sold 7000 tons of foundry and malleable iron during the week nearly equally divided between the last quarter and the first quarter and including a 2000-ton lot for this year's delivery. Business with other furnaces was very light, being limited mostly to car lots for early shipment. Some activity has developed in low phosphorus iron, a Valley producer taking several lots aggregating 1200 tons. Several new inquiries for foundry and malleable iron for the first quarter have come out. Some consumers seem anxious to buy and other inquiries apparently are only market feelers. One live inquiry for that delivery is for 4000 tons of foundry iron and one seller is figuring on several other inquiries aggregating the same amount. Some producers are still declining to quote for the first quarter. While the trade expects present prices to hold, there seems to be a little expectation of an advance for the first quarter. Prices are unchanged at $19.50 to $20 Lake and Valley furnace for foundry and malleable iron, with most producers holding to the higher price. However, one producer is not holding definitely to the lower price to the points where it has a freight disadvantage. For Cleveland delivery the price is unchanged at $20.50 at furnace. A few first quarter sales aggregating 500 tons of Southern foundry iron have been made at $18 for the first quarter. A Valley furnace has marked up its prices 50c. on low phosphorus iron. An inquiry is pending for 200 tons of silvery iron and is expected to test the market, which is regarded as $1 to $2 a ton below the regular schedule.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$19.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	21.00
Southern fdy., sil. 1.75 to 2.25....$23.51 to	24.00
Malleable	21.00
Ohio silvery, 8 per cent	31.52
Stand. low phos., Valley furnace.. 28.00 to	28.75

Bolts, Nuts and Rivets.—Following the recent rush in specifications on third quarter contracts, orders have been light this month, but there has been improved demand in the last day or two as consumers are beginning to specify on fourth quarter contracts taken at the advance in prices. The market appears firm. Approximately 50 per cent of the raw material used by Cleveland bolt and nut manufacturers is in the form of wire or wire rods and local makers have benefited to that extent in having Cleveland as the basing point on these products. Rivets are quiet.

Semi-Finished Steel.—Specifications against contracts which have been held back because of the unsettled situation due to the abandonment of the Pittsburgh basing point have improved but there is no new demand. The leading local maker continues to quote sheet bars, billets and slabs at $37.50, Cleveland.

Steel Bars, Plates and Structural Material.—There is considerable irregularity in delivered prices on steel bars on which 2c. mill is now the common price for good sized lots. Prices as low as 2.10c. delivered have appeared, which figure back to 1.91c., Pittsburgh. The delivered price ranges up to 2.20c., Cleveland, and some small lot business is being taken at 2.30c. Plates range from 1.85c. to 1.90c., Pittsburgh, with desirable lots occasionally going at 1.80c. Structural material is quoted at 1.90c. to 2c., Pittsburgh.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.60c.; cold-rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 3.85c.; narrower than 1 in. or lighter than No. 20 gage, 4.35c.; No. 9 annealed wire, $3.05 per 100 lb.; No. 9 galvanized wire, $3.50 per 100 lb.; common wire nails, $3.25 base per 100 lb.

Sheets.—Sheets are light in demand. Delivered prices are being quoted and mills generally are holding to a minimum of 3.40c. for black, 2.60c. for blue annealed and 4.50c. for galvanized with Pittsburgh base, although some mills are quoting $2 a ton higher. However, some concessions are being made to absorb freight differentials.

Hot-Rolled Strips.—Wide strip steel is weak, with net prices usually quoted that figure back to 2.10c. to 2.20c., Pittsburgh base. Hoops have sold at 2.60c., Cleveland.

Reinforcing Bars.—Rail steel bars are commonly quoted at 1.90c., Pittsburgh, but this might be shaded, as the market lacks strength because of competition of billet steel bars. The demand has quieted down.

Warehouse Business.—Although jobbers now have the advantage of lower prices on screw steel owing to the adoption of Cleveland base, no reductions have as yet been made on warehouse prices on screw stock. Warehouse business shows an improvement over last month.

Coke.—The demand for foundry coke continues very slow with sales limited mostly to car lots. Prices are unchanged at from $4 to $5.50 for standard Connellsville foundry coke.

Old Material.—No further weakness has developed in the scrap market and quotations remain the same as a week ago. There appears to be a somewhat better feeling in the trade and some predict a little stiffening in prices, as it is claimed that considerable material will have to be bought by dealers who have sold short. A Weirton, W. Va., consumer purchased a round tonnage of scrap during the week at reported prices of $17.50 for heavy melting steel and $16.25 for compressed sheet steel. There is very little activity on the part of the mills in either the Youngstown or Cleveland district although Valley district dealers are buying scrap to fill old orders. Prices that prevailed during the week for dealers' purchases in the Valley district were $17.50 to $18 for heavy melting steel, $15.50 to $16 for compressed sheet steel and $13.75 to $14 for machine shop turnings.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$15.25 to $15.50
Rails for rolling	15.75 to 16.00
Rails under 3 ft	17.00 to 17.50
Low phosphorus melting	17.75 to 18.00
Cast iron borings	13.25 to 13.50
Machine shop turnings	13.25 to 13.50
Mixed borings and short turnings	13.25 to 13.50
Compressed sheet steel	13.25 to 13.50
Railroad wrought	13.50 to 13.75
Railroad malleable	17.75 to 18.25
Light bundled sheet stampings	12.50 to 12.75
Steel axle turnings	13.25 to 13.50
No. 1 cast	18.50 to 18.75
No. 1 busheling	13.00 to 13.25
Drop forge flashings	11.25 to 11.50
Railroad grate bars	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues	11.00 to 11.50

Philadelphia

Steel Business Making Very Slight Gains—Pig Iron Market Dull

PHILADELPHIA, Oct. 14.—The past week in the local steel and pig iron situation has been merely a repetition of the several preceding weeks. There has been each week a slight gain in the volume of steel orders, but this gain has not been spread out evenly over all products; while some have gained, others have stood still or have lost ground. Plates are showing little, if any, gain, while structural shapes have probably shown a loss as compared with the fair degree of activity of last month. In such products as steel bars, pipe, tin plate and sheets, there has been a fair degree of improvement, which seems to be cumulative. Pig iron is uninteresting because of the lack of any developments that serve to indicate the future. Scrap is losing ground and some prices are weaker or actually lower.

Ferroalloys.—On instructions from their principals, selling agents for British ferromanganese have advanced their quotations to $100, duty paid, seaboard. No sales are yet reported at this figure, but as the leading domestic producer has for several weeks been quoting $100, furnace, it is likely that the next business will be done at not less than $100.

Pig Iron.—Statistically the Eastern pig iron situation is growing better from the producers' point of view, but the market is no stronger and demand continues at low ebb. Stocks at furnace yards are being reduced and pig iron is being produced in this district at a rate less than shipments, but the fact remains that orders are also so greatly below shipments that a new buying movement is needed to give new life to the market. A buying movement for first quarter is in the making, but has been discouraged by some producers, who do not see any advantage in selling for that period at present prices. They believe that prices will not go any lower and that they may go higher and they would prefer to take chances on the latter contingency by waiting at least until after election before signifying their willingness to put first quarter business on their books. Some first quarter contracts have, of course, been entered into, but the amount of such buying has not been extensive, nor is it likely to be until the business and political outlook for the first quarter of the year is more clearly evident.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.26 to $22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.63
East. Pa. No. 1X	22.26 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.17 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.67 to 29.17
Basic delivered eastern Pa.	20.00 to 21.00
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace)	24.00 to 25.00

Billets.—An inquiry for a fair-sized tonnage of billets would be subject to special negotiations and there is every reason to believe that mills would not hold out for the present nominal quotations of $36, Pittsburgh, on rerolling quality and $41 for forging quality. Negotiations now being carried on by an Eastern buyer indicate that the price at which the business is taken will not exceed $35 and may be below that figure.

Plates.—No marked increase has developed in the volume of business placed with Eastern mills, but there are indications that current railroad buying may benefit some of the mills more than has been apparent. The Norfolk & Western Railroad, which will build 1000 steel cars in its own shops, is inquiring for 6000 tons of plates, 3500 tons of shapes and a few hundred tons of bars, and the plate business is likely to come to an Eastern mill. Some other plate orders for repair of cars in railroad shops are in prospect. The price situation is unchanged, 1.60c. to 1.65c., Pittsburgh, being quoted by Eastern mills, depending upon the size of the tonnage.

Structural Material.—The Penn Athletic Club job, about 4300 tons, which has been hanging over the market for weeks, has finally been placed with the New York Shipbuilding Corporation. This is the only important work in this district except the subway tonnage, on which bids are to be opened next week. Orders for shapes are falling off and prices are soft. Quotations range from 1.85c. to 1.90c., Pittsburgh, on ordinary lots, with 1.80c. having been done on some of the more attractive lots. The structural subsidiary of the Steel Corporation at Pencoyd, Pa., is quoting on an f.o.b. mill basis and its prices have injected a new factor into the shape market.

Bars.—Demand for steel bars shows some gains and mills are having little or no difficulty in getting 2c., Pittsburgh, despite the weakness in some other rolled products. The only concessions from this price are apparently on reinforcing bars and then not to exceed $1 a ton. Bar iron is quoted by Eastern mills on a Pittsburgh basis of 2c., or 2.32c., delivered Philadelphia.

Warehouse Prices.—Local jobbers quote as follows for steel products out of stock:

Soft steel bars and small shapes, 3.10c.; iron bars (except bands), 3.10c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ⅛ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.10c.; tank steel plates, ⅜ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.75c.; black sheets, No. 28 gage, 4.75c.; galvanized sheets, No. 28 gage, 5.85c.; square twisted and deformed steel bars, 3.85c.; structural shapes, 3.10c.; diamond pattern plates, ¼-in., 5.30c.; ⅜-in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.05c.; squares and hexagons, cold-rolled steel, 4.55c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.10c.; narrower than 1 in., all gages, 4.60c.; steel bands, No. 12 gage to ⅜ in., inclusive, 3.85c.; rails, 3.35c.; tool steel, 8.50c.; Norway iron, 6.75c.

Old Material.—A steel company has made purchases of about 12,000 tons of heavy melting steel in the past week and the bulk of this tonnage has been obtained at $16.50, delivered. The market is weaker and $17 is now the best offer of any of the Eastern mills. Blast furnace borings and turnings are also lower, a leading user and leading brokers having reduced their quotations. Otherwise there are no price

changes of importance, but all grades are weak and it is apparent that the recent advance was somewhat overdone on the strength of the belief in the scrap trade that steel business would show greater gains than have been registered. Having now readjusted its opinion, the scrap trade recognizes that it will require fresh evidence of substantial gains in finished steel orders to bring renewed strength to the scrap market.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$16.50 to $17.00
Scrap rails	16.50 to 17.00
Steel rails for rolling	18.50
No. 1 low phos., heavy 0.04 and under	21.00 to 21.50
Couplers and knuckles	20.00 to 20.50
Rolled steel wheels	20.00 to 20.50
Cast-iron car wheels	17.50 to 18.00
No. 1 railroad wrought	18.50 to 19.00
No. 1 yard wrought	16.50 to 17.00
No. 1 forge fire	14.00 to 14.50
Bundled sheets (for steel works)	13.50 to 14.00
Mixed borings and turnings (for blast furnace use)	12.50 to 13.50
Machine shop turnings (for steel works use)	13.50 to 14.00
Machine shop turnings (for rolling mill use)	14.00 to 14.50
Heavy axle turnings (or equivalent)	15.00 to 16.00
Cast borings (for steel works and rolling mills)	14.00
Cast borings (for chemical plants)	16.00 to 16.50
No. 1 cast	17.50 to 18.00
Heavy breakable cast (for steel plants)	16.50
Railroad grate bars	15.00
Stove plate (for steel plant use)	15.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting	24.00 to 25.00
Steel axles	24.00 to 25.00

Imports.—Last week's imports at Philadelphia were as follows: Shapes from Belgium, 216 tons; steel bars from Belgium, 300 tons; blooms from France, 613 tons; pig iron from France, 95 tons; chrome ore from Portuguese Africa, 4303 tons; ferromanganese from England, 410 tons; iron ore from Germany, 256 tons.

Chicago Mills Reported Well Supplied with Orders

YOUNGSTOWN, Oct. 14.—Judging from inquiries received by Mahoning Valley mills from consumers and jobbers in the Chicago area, producing mills there are filled with business and are unable to make early deliveries on new tonnage. Consumers are consequently obliged to turn to mills farther east for their requirements and to pay a higher delivered price. This situation, it is pointed out, indicates some of the results of the elimination of Pittsburgh price basing.

McNamara Again in Trouble

John J. McNamara, business agent and secretary of the Bridge and Structural Iron Workers' Union, Indianapolis, who served nine years of a 15-year sentence for his connection with the dynamiting of the Los Angeles *Times* building in 1910, was indicted by the Marion (Ind.) County grand jury Cct. 9, on four charges of blackmail. The indictments followed grand jury investigations of acts of vandalism in connection with erection of buildings in Indianapolis.

Headed by President James A. Campbell, directors of the Youngstown Sheet & Tube Co., Youngstown, inspected the company's properties in the Chicago district the latter part of last week. The party left Youngstown Thursday evening. The trip followed a special directors' meeting called to discuss the company's position following the elimination of Pittsburgh price basing, and to consider extensions for the Chicago plant as outlined by President Campbell. The company plans to create additional finishing capacity in the Chicago area, covering diversified products, so as to strengthen its competitive position.

RECORD ATTENDANCE

Many Register on First Day of American Foundrymen's Convention

Technical Sessions Arouse Much Interest—Large Number of Exhibitors of Equipment—J. A. Olsen Is New President

MILWAUKEE, WIS., Oct. 14.—Prominent men in the foundry industry, practical foundrymen, metallurgists and others from many sections of the country are here in large numbers at the twenty-eighth annual convention and exhibition of the American Foundrymen's Association at the Milwaukee Auditorium. Besides the central and eastern portions of the country, California, Utah, British Columbia and other sections of Canada are well represented. In registered attendance, Monday eclipsed all previous records for the first day with a total of about 2000. From 2500 to 3000 is the aggregate for today and yesterday.

Technical Subjects

Keen interest is being manifested in the technical sessions, of which there are two and sometimes three being held simultaneously each morning and afternoon. The two steel foundry sessions yesterday and today stand out prominently for the quality and variety of the papers and discussions. They surpass any similar meetings for some years.

A good attendance characterized the three sessions yesterday and today on non-ferrous foundry topics held by the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, always a feature of the foundry gatherings. Representatives of this section held a dinner last night at the Pfister Hotel at which 35 to 40 sat down.

A profitable session on apprentice training was another feature today. The technical sessions continue through Thursday with 49 papers and 13 committee reports, its totals for the week.

Exhibition Fills Hall

The exhibition of foundry equipment and other material completely fills the spacious auditorium hall and basement rooms. The number of exhibitors has been surpassed only once, namely in Columbus in 1920. This year, however, the weight of its exhibits exceeds any other record and the electric load to operate is at least 1000 hp., compared with 700 hp. at the best previous record. In space this year's affair occupies 55,300 sq. ft., as against 47,300 sq. ft. at Cleveland in May, 1923, the last exhibition.

The annual business session will be held tomorrow morning, at which J. A. Olsen, president Ohio Brass Foundry, Mansfield, Ohio, will be declared elected president for next year. Advocates of Detroit for next year's meeting are eagerly active. A complete report of the sessions and the exhibition will appear in THE IRON AGE of Oct. 23.

Factory Floor Surfaces

A book of 34 pages, with seven illustrations, has just been issued by Aberthaw Co., Boston, dealing with the surfacing of factory floors. The book is available for distribution to engineers, builders and industrial owners. It represents the experience of the company in more than 25 years of operation in producing factory buildings and studying their uses and requirements. It deals successively with wooden floor surfaces, granolithic floor surfaces and a comparison between granolithic and hardwood floors. Wood block floors are discussed, as well as special or proprietary floors. The second part of the book is taken up with recommended specifications covering all of these, except the proprietary type.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
Oct.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
8.....	13.12½	12.75	49.07½	8.00	7.82½	6.55	6.20
9.....	13.12½	12.75	49.17½	8.00	7.82½	6.55	6.20
10.....	13.12½	12.87½	49.75	8.00	7.82½	6.57½	6.22½
11.....	13.12½	12.87½	....	8.00	7.82½	6.57½	6.22½
14.....	13.25	13.00	50.25	8.00	7.82½	6.65	6.30

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Oct. 14.

The markets are a little firmer this week, with moderate price advances in copper, zinc and tin. Slightly better business is accountable for some of the gain in strength.

Copper.—Producers of copper and traders regard the market as firmer this week. Producers who would gladly have accepted 12.87½c per lb., delivered, a week ago, are now asking 13c. and some quotations are as high as 13.12½c., though there is nothing to indicate that the latter price is obtainable today (Tuesday). A leading wire manufacturer is reported to have contracted for 2,000,000 lb. at 12.87½c. per lb., delivered, and other sales at this figure for delivery in the Connecticut Valley are said to have been made. Producers have probably taken all of the business they desire at 12.87½c., and hence the higher quotations of the past day or two. The export situation is likewise a trifle firmer, with exporters bidding 13.05c. f.a.s. for December shipment.

Tin.—Sales of the week probably did not exceed 400 or 500 tons, and practically all of this was taken by consumers out of New York stocks for prompt delivery. There was a disposition among sellers to quote October shipment about ⅛c. per lb. under November, undoubtedly for the reason that a greater proportion of the tin arriving this month has been sold than that of November. Today (Tuesday) the London market was higher and there was also a gain in the rate of exchange, advancing today's quotation here to 50.25c. per lb. A significant development is shown by cables stating that from Oct. 8 to 13, inclusive, sales at Singapore totaled 1650 tons, a fairly large amount for less than a week, and indicating also that the Government must have sold some of its stocks. London prices today were £245 5s. for spot standard, £247 12s. 6d. for future standard, and £246 5s. for spot Straits. The Singapore price was £248.

Lead.—The American Smelting & Refining Co.'s price continues at 8c., New York, while the St. Louis price remains at 7.82½c. There is said to be very little lead available for shipment in the remainder of this month. The market is firm without any unusual activity.

Old Metals.—Business is quiet and values stationary. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	12.50
Copper, heavy and wire	11.75
Copper, light and bottoms	10.50
Heavy machine composition	10.00
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.75
Lead, heavy	7.125
Lead, tea	6.00
Zinc	4.25
Cast aluminum	17.50
Sheet aluminum	17.50

Zinc.—Demand for zinc from England has strengthened the American market, and prime Western is now being quoted at 6.30c., St. Louis. The domestic market is by no means active, and the firmer tone is attributed solely to the London buying.

Nickel.—Quotations for shot and ingot nickel are 28c. to 30c. per lb. and electrolytic nickel is quoted at 33c.

Antimony.—Chinese metal for spot delivery is quoted at 11c. per lb., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., duty paid, delivered.

Chicago

CHICAGO, Oct. 14.—With consumer buying lagging and trading largely speculative, copper is slightly stronger and tin and zinc have advanced. Export demand has strengthened zinc. Among old metals zinc and brass grades have declined.

We quote in carload lots: Lake copper, 13.25c.; tin, 51c.; lead, 7.85c.; spelter, 6.30c.; antimony, 12.50c.; in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 8c.; yellow brass, 6.75c.; lead pipe, 6.75c.; zinc, 3.75c.; pewter, No. 1, 24c.; tin foil, 30c.; block tin, 38c., all buying prices for less than carload lots.

FOREIGN MARKETS QUIET

Inquiries Small—Nippon Tin Plate Placed—Foreign Prices Not Yet Competitive on Atlantic Coast

NEW YORK, Oct. 14.—The few inquiries current from foreign sources are for small tonnages in most cases. Demand from South American markets is light and quotations made by American mills meet the competition of European sellers. Chinese trade is practically at a standstill as a result of the civil war. The confusion in China has had an effect on Japanese trade, which has been somewhat curtailed since the beginning of hostilities. Japanese buyers are faced by a continually depreciating exchange, recently forced to a still lower point as a result of cotton purchasing in the United States. A reaction of the exchange is generally expected by exporters in touch with Japanese conditions when the season for silk selling arrives, early in 1925.

Of the current inquiries bids have been opened on the 6½-miles of high T rails asked for by the Kobe Municipal Tramway Bureau and the South Manchuria Railway Co. has opened bids on the 45 miles of 100-lb. rails, but in neither case has the award been made. The inquiry of the Nippon Oil Co. for 56,000 boxes of tin plate, following a slight delay, was awarded last week to Mitsui & Co., New York, and is understood to have been placed by the exporter with the two foremost independent mills. There is a small inquiry current from another Japanese oil company for a few thousand boxes of oil can sizes of tin plate. No action has as yet been taken on the 93 tons of car building material recently asked for by a car builder in Osaka.

With the domestic market at a low point, efforts of importers to sell European steel to American consumers are at present largely unsuccessful, except on the Pacific Coast. Bars of the specification demanded by American users are quoted at about 1.55c. per lb., base, by German mills and to this price must be added the duty of 50c. per 100 lb. and ocean freights.

Construction projects to increase the water supply are among the important foreign engineering projects contemplated, according to information received by the Department of Commerce. The City of Bordeaux, France, will begin work on a water supply system shortly and South Devon, New Brunswick, will shortly begin work connecting Killarney Lake with the Devon reservoirs.

Surveys are being made at the Bay of Fundy to establish the practicability of harnessing the tides without interfering with navigation. The project, if attempted, would be a greater engineering undertaking than construction of the Panama Canal, it is said.

Prices of Finished Iron and Steel Products

(Carload Lots)

Tank Plates

F.o.b. Pittsburgh mills, base, per lb.....1.80c. to 1.90c.
F.o.b. Chicago, base, per lb.....2.00c. to 2.10c.

Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.00c.
F.o.b. Chicago, base, per lb.....2.00c. to 2.10c.

Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb....2.00c. to 2.10c.
Soft steel bars f.o.b. Chicago, base, per lb.....2.00c. to 2.10c.
Reinforcing steel bars f.o.b. P'gh mills, base, per lb....2.00c.
Rail steel bars f.o.b. Chicago district mills, base, per lb..2.00c.
Common iron bars delivered New York, base, per lb....2.34c.
Common iron bars f.o.b. Chicago, base, per lb.....2.10c.
Refined iron bars f.o.b. P'gh mills, base, per lb..2.90c. to 3.00c.
Common iron bars delivered Philadelphia, base, per lb..2.32c.

Hot-Rolled Flats

(Pittsburgh)

Hoops, base, per lb.....2.50c. to 2.60c.
Bands, base, per lb.....2.40c. to 2.50c.
Strips, base, per lb.....2.25c. to 2.40c.

Cold-Finished Steel

Bars and shafting, f.o.b. P'gh mills, base, per lb.....2.70c.
Bars, f.o.b. Cleveland mills, base, per lb.....2.70c.
Bars and shafting f.o.b. Chicago mills, base, per lb.....2.70c.
Bars, Worcester mills, base, per lb.....2.85c.
Shafting, ground, f.o.b. mill, base, per lb.....3.10c.
Screw stock, base, per lb., Cleveland and P'gh.....2.70c.
Strips, f.o.b. P'gh mills, base, per lb.....4.00c.
Strips, f.o.b. Cleveland mills, base, per lb.....4.00c.
Strips, f.o.b. Chicago mills, base, per lb.....4.30c.
Strips, f.o.b. Worcester mills, base, per lb.....4.15c.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg $2.75
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.50
Annealed fence wire, base, per 100 lb..... 2.65
Galvanized wire No. 9, base, per 100 lb..... 3.10
Galvanized barbed, base, per 100 lb..... 3.45
Galvanized staples, base, per keg..... 3.45
Painted barbed wire, base, per 100 lb..... 3.20
Polished staples, base, per keg..... 3.20
Cement coated nails, base, per count keg..... 2.15
Woven wire fence, base, per net ton to retailers.....$65.00

Chicago district mill prices are $2 per ton above the foregoing and Chicago delivered prices are $3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices $3 a ton higher; Worcester, Mass., mills $3 a ton higher on products of that plant, and Duluth, Minn., mills $4 a ton higher.

Bolts and Nuts

(Chicago, Cleveland and Pittsburgh)

Machine bolts, small rolled threads..60 and 20 per cent off list
Machine bolts, all sizes, cut threads..60 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads, 60 and 10 per cent off list
Carriage bolts, cut threads, all sizes.....60 per cent off list
Hot-pressed nuts, blank or tapped, square.....4.50c. off list
Hot-pressed nuts, blank or tapped, hexagons.....5c. off list
C.p.c. and t. square or hex. nuts, blank or tapped..4.50c. off list
Eagle carriage bolts.....65, 10 and 10 per cent off list
Plow bolts .....50, 10 and 5 per cent off list
Semi-finished hex. nuts:
- 7/8 in. and smaller, U. S. S....80, 10, 10 and 5 per cent off list
- 1 in. and larger, U. S. S....75, 10, 10 and 5 per cent off list
- Small sizes, S. A. E.....80, 10, 10, 10 and 5 per cent off list
- S. A. E., 5/8 in. and larger.....80, 10 and 5 per cent off list

Stove bolts in packages .....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 10 per cent off list
Bolt ends with cold pressed nuts....50 and 10 per cent off list
Washers .....6.00c. to 6.25c. off list.
Lock washers .....80 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Chicago and Pittsburgh)
(To jobbers and consumers in large quantities)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.25	$4.25	⅞-in.	$13.25	$13.50
5/16-in.	4.90	4.90	1-in.	16.25	16.50
⅜-in.	5.90	6.25	1⅛-in.	22.50	23.00
7/16-in.	7.50	8.50	1¼-in.	34.00	34.00
½-in.	9.75	10.00	1⅜-in.	53.00	55.00

Larger sizes—Prices on application.

Cap and Set Screws

(F.o.b. shipping point.)

Milled hex. cap screws.....85 per cent off list
Milled standard set screws, case hardened..85 per cent off list
Milled headless set screws, cut thread.....85 per cent off list
Upset hex. head cap screws, U. S. S. thread, 85 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread, 85 and 10 per cent off list
Milled studs .....80 per cent off list

Rivets

Large, f.o.b. P'gh and Cleveland mill, base, per 100 lb..$2.60
Large, f.o.b. Chicago mills, base, per 100 lb..... 2.75
Small, f.o.b. P'gh and Cleveland mills 70, 10 and 5 per cent off list
Small, f.o.b. Chicago mills.....70 and 10 off list

Rails and Track Equipment

(F.o.b. mill)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.80c. to 1.90c.
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.
Spikes, 7/16 in. and larger, base, per 100 lb.....$2.70 to $3.00
Spikes, ½ in. and smaller, base, per 100 lb.... 3.00
Spikes, boat and barge, base, per 100 lb..... 3.00
Track bolts, all sizes, base, per 100 lb..... 3.75 to 4.00
Track bolts, heat treated, base, per 100 lb..... 4.25 to 4.50
Tie plates, per 100 lb..... 2.40 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3	61	50½
¼ to ⅜	47	30½	¼ to ⅜	+11	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½	60	49½	1 to 1½	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ points, with supplementary discount of 5 per cent.

NOTE—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2½ points less.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 4 to 5 fives extra are given on lap welded steel tubes and 3 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55-58	3 and 3¼ in.	36-39
1¼ and 1½ in.	47-50	3½ and 3¾ in.	37-40
1¾ in.	31-34	4 in.	41-44
2 and 2¼ in.	22-25	4½ in. and 5 in.	33-37
2 and 2¾ in.	32-35		
Hot Rolled			
3 and 3¼ in.	38-41	4-in.	43-46
3½ in. and 3¾ in.	39-42		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....87 per cent off list
Carbon 0.30 to 0.40, base .....85 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	15	2¼-in. O.D. 10 gage	20
2-in. O.D. 11 gage	16	3-in. O.D. 7 gage	35
2-in. O.D. 10 gage	17	1½-in. O.D. 9 gage	15
2¼-in. O.D. 12 gage	17	5½-in. O.D. 9 gage	55
2¼-in. O.D. 11 gage	18	5½-in. O.D. 9 gage	57

Tin Plate

Standard cokes, per base box f.o.b. Pittsburgh district mills $5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60

Terne Plate

(F.o.b. Pittsburgh district mills)
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.00	20-lb. coating I. C.	$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	42c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	40c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	$8.00 to $8.50
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	18.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	80c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$90.00 to $100.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	92.50 to 95.00
Ferrosilicon, 50 per cent, delivered	72.00 to 75.00
Ferrosilicon, 75 per cent	140.00
Ferrotungsten, per lb. contained metal	87c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	10.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated.)

Spiegeleisen, domestic, 19 to 21 per cent	$31.00 to $33.00
Spiegeleisen, domestic, 16 to 19 per cent	30.00 to 32.00

Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42; 12 per cent, $44.50; 14 to 16 per cent (electric furnace), $36.00.

Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	$18.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	19.50

Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$40.00 to $43.00	$36.00 to $40.00
Maryland	45.00 to 47.00	40.00 to 42.00
Ohio	40.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton	6.00 to 7.00	
Silica Brick:		
Pennsylvania		32.00
Chicago	43.00 to 44.00	
Birmingham		50.00
Ground silica clay, per net ton	7.50 to 8.00	
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		45.00

Sheets

Blue Annealed

(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh dist. mills	2.60c. to 2.70c.
*Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills	2.80c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills	3.40c. to 3.50c.
*No. 28 (base) per lb., f.o.b. Chicago dist. mills	3.60c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills	4.50c. to 4.60c.
*No. 28 (base) per lb., f.o.b. Chicago dist. mills	4.70c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mills	3.40c. to 3.50c.
*No. 28 (base) per lb., f.o.b. Chicago dist. mills	3.60c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill	4.60c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill	4.90c.

*Add 5c. per 100 lb. for delivery in Chicago.

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$36.00 to $37.00
Forging billets, ordinary carbons	41.00 to 42.00
Sheet bars, Bessemer	37.00 to 37.50
Sheet bars, open hearth	37.00 to 37.50
Slabs	36.00 to 37.00
*Wire rods, common soft, base, No. 5 to ⅝-in.	45.00 to 46.00
Wire rods, common soft, coarser than ⅝-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2c.
Skelp, sheared, per lb.	2c.
Skelp, universal, per lb.	2c.

*Chicago mill base is $48.00.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100* (¼% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3½% Nickel)	4.75
2500 (5% Nickel)	6.00 to 6.50
3100 (Nickel Chromium)	3.65 to 3.75
3200 (Nickel Chromium)	5.50 to 5.75
3300 (Nickel Chromium)	7.25 to 8.00
3400 (Nickel Chromium)	6.50 to 7.00
5100 (Chromium Steel)	3.50 to 3.75
5200* (Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.50
6100 (Chromium Vanadium spring steel)	4.25 to 4.50
9250 (Silicon Manganese spring steel)	3.50 to 3.75
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.25 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.75 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold drawn bars is 1c. to 1¼c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

FABRICATED STEEL BUSINESS

Both Awards and Inquiries Show a Marked Falling Off in the Past Week

Structural steel awards totaled less than 17,000 tons for the past week, and this included one job of 4300 tons in Philadelphia. New work in the market is very light, slightly under 7000 tons, a figure unusually small as compared with the amounts reported in THE IRON AGE in recent weeks. Awards are:

Penn Athletic Club, Philadelphia, 4300 tons, to New York Shipbuilding Corporation.

New York Telephone Co., building at Poughkeepsie, N. Y., 400 tons, to Levering & Garrigues Co.

Warehouse, Jerome Avenue and 190th Street, New York, 450 tons, to Levering & Garrigues Co.

L. T. Building, Second Avenue and Fourteenth Street, New York, 500 tons, to Hay Foundry & Iron Works.

Kings County Lighting Co., building at Fourth Avenue and Senator Street, Brooklyn, 600 tons, to Hay Foundry & Iron Works.

Public Service Corporation of New Jersey, sub-station, 200 tons, to McClintic-Marshall Co.

H. K. Porter Locomotive Co., Pittsburgh, office building, 125 tons, to Jones & Laughlin Steel Corporation.

Reeves Brothers Co., Youngstown, erecting plant at Birmingham, 1400 tons, to McClintic-Marshall Co.

Great Northern Railway, bridge work, 1800 tons, to Wisconsin Bridge Co.

Chicago & Northwestern Railway, chutes, doors, etc., for ore dock No. 6, Escanaba, Mich., 1825 tons, to American Bridge Co.

Clift Hotel, San Francisco, addition, 1573 tons, to Dyer Brothers.

Royal Theater Co., Joliet, Ill., theater and commercial building, 755 tons, to Gage Structural Steel Works.

City of Syracuse, N. Y., stand pipe, 500 tons, to Chicago Bridge & Iron Works.

Imse-Schilling Sash & Door Co., St. Louis, warehouse, 395 tons, to Stupp Brothers Bridge & Iron Co.

Pullman Car & Mfg. Corporation, passenger car finishing shop, Pullman, Ill., 362 tons, to Kenwood Bridge Co.

A. E. Staley Mfg. Co., Decatur, Ill., boiler house, 354 tons, to Mississippi Valley Structural Steel Co.

Columbus Railway, Light & Power Co., garage, 800 tons, to Massillon Structural & Bridge Co.

Keith Theater, Columbus, Ohio, 300 tons, to M. Shapiro Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Apartment building, Fifty-seventh Street and Sixth Avenue, New York, 1000 tons.

Brooklyn Times, addition to building at 532 Atlantic Avenue, Brooklyn, 500 tons.

Garage, 207-211 West Seventy-sixth Street, New York, 350 tons.

United States Cast Iron Pipe & Foundry Co., plant addition at Burlington, N. J., 2500 tons.

New York Central Railroad, grade crossing elimination at Suspension Bridge, N. Y., 900 tons.

Apartment building, East Sixty-third Street, New York, 600 tons.

The Bedell Co., store at Portland, Ore., 1100 tons.

The Marcus Contracting Co. was low bidder on one section of the Brooklyn subway, on which bids were opened last week, this section calling for 3000 tons of steel.

Wisconsin Steel Works, South Chicago, a 40-in. blooming mill building, 800 tons.

Mead-Morrison Mfg. Co., Chicago, one 12-ton man trolley bridge, 210 tons, and one 12-ton and one 6-ton trolley bridge, 713 tons.

Chicago Civic Opera Co., studio and storage building, Chicago, 440 tons.

Grand Trunk Railway, deck and through plate girder spans, 150 tons.

Rock Island Lines, one 90-ft. girder span, 146 tons.

Peerless Portland Cement Co., Detroit, clay storage building, 125 tons.

Knights of Columbus Building, Canton, Ohio, 180 tons. Bids taken.

RAILROAD EQUIPMENT BUYING

Activity of Past Several Weeks Is Not Maintained, Orders Falling Off

There have been no significant developments in the railroad equipment field in the past week. Orders are few and inquiries are scattered and not of unusual importance. The Norfolk & Western is asking for prices on 10,000 tons of steel for 1000 cars it will build in its own shops.

The Great Northern has ordered 500 ore cars from the Bethlehem Steel Corporation and is inquiring for 500 to 1500 automobile cars, 40 air-dump cars and 38 underframes for refrigerator cars.

The Texas Co. is inquiring for 500, 800 or 1000 10,000-gal. tank cars.

The St. Louis-San Francisco will repair 400 or 500 gondolas in its own shops.

The Central Railroad of New Jersey is inquiring for 50 box cars.

The Buffalo & Susquehanna Railroad is in the market for 400 steel gondolas.

The Chicago, Rock Island & Pacific has contracted for the repair of 146 steel gondolas with the Western Steel Car & Foundry Co.

The Lehigh Valley Railroad has ordered 5 passenger coaches and 3 dining cars from the Pullman Car & Mfg. Corporation.

The Illinois Central has placed 30 coaches and 8 compartment coaches with the Pullman Car & Mfg. Corporation and 6 chair, 9 baggage and 10 baggage and mail cars with the American Car & Foundry Co.

The North American Car Co. is inquiring for 150 refrigerator cars.

The Norfolk & Western will construct 1000 hopper cars in its own shops.

The Southern has placed 550 additional box cars with the American Car & Foundry Co.

STEEL AND INDUSTRIAL STOCKS

The range in prices of active steel and industrial stocks from Monday of last week to Monday of this week was as follows.

Allis-Chalmers ..	57	59½	Gulf States Steel	69¼	72½
Allis-Chal. pf....	99	99	Inland Steel.....	36	36⅝
Am. B. S. & Fdy.	81	81¼	Int. Har. pf.....	92¾	93½
Am. B. S. & Fdy. pf.	106	106	Jones & L'lin pf.	110	110½
Am. Can.....	128½	133	Lima Loco.....	59¾	60½
Am. Can pf.....	116½	116½	Nat.-Acme	3⅜	5
Am. Car & Fdy..	166	166½	Nat. En. & Stm.	20¾	21⅝
Am. C. & F. pf..	120	120⅛	Nat. En. & S. pf.	71	71
Am. Locomotive.	78	79	N. Y. Air Brake	41	42⅞
Am. Loco. pf....	120	120	Otis Steel.....	7¼	7½
Am. Radiator...	116½	118½	Pressed Stl. Car	44⅝	45
Am. Steel Fdries.	35¾	36¼	Pressed Steel pf.	71	71½
Am. Stl. Fd. pf..	107	107	Replogle Steel...	11	11½
Bald. Loco.....	118⅞	122⅝	Republic	44⅞	46¾
Bald. Loco. pf...	115	115	Republic pf.....	86	86
Beth. Steel.....	43	44¾	Sloss-Sheffield ..	68½	70½
Beth. Stl. 7% pf.	93¼	94	Steel of Canada.	77	79
Beth. Stl. 8% pf.	107	108	Transue-Wms. ..	30	30
Br. Em. Stl. 1 pf.	31½	31½	Un. Alloy Steel..	20¼	21¾
Chic. Pneu. Tool.	85½	85½	U. S. Pipe.....	110¼	115⅝
Colo. Fuel.....	38	43	U. S. Pipe pf....	98½	98½
Crucible Steel...	54⅞	57¼	U. S. Steel.....	106⅝	108¾
Crucible Stl. pf..	89¼	90	U. S. Steel pf...	122	122¾
Deere pf.....	74	75½	Vanadium Steel.	22⅝	23½
Gen. Electric....	242½	258½	W'house Air Br.	93	93
Gt. No. Ore Cert.	29⅛	29⅞	Y'gstown S. & T.	64	65

The Wheeling Steel Corporation, controlling 14 plants along the Ohio River Valley, in West Virginia and Ohio, as well as its own supply of coal and of iron ore, producing pig-iron, steel billets, slabs, plates, tubes, bars, sheets and a broad line of finished steel products, and doing a business last year aggregating more than $71,000,000, has sold to banking interests $15,000,000 5½ per cent first and refunding mortgage sinking fund bonds, dated July 1, last, and due in 1948. Upon completion of this financing the company will have oustanding, a total funded debt of $29,481,000, and a total capital stock of $66,878,300. On the other side of the ledger it has, after deducting all liabilities other than its funded debt, net assets aggregating $100,493,699, more than three times the total funded debt. Net current assets alone amount to $31,961,303. The bonds are offered for public subscription at 96½ and accrued interest, yielding better than 5¾ per cent on the investment.

PERSONAL

Dr. William F. Durand

Dr. William F. Durand, president-elect for 1925 of the American Society of Mechanical Engineers, was born in Bethany, Conn., March 5, 1859. He was graduated from the United States Naval Academy in 1880 and for seven years was in naval service, being attached to the engineer corps. In 1887 he resigned to become professor of mechanical engineering at the Michigan State Agricultural College, and in 1891 was appointed professor of marine engineering at Cornell University. Since 1904 and until June of this year Dr. Durand has been professor of mechanical engineering at Leland Stanford, Jr., University.

DR. W. F. DURAND

Dr. Durand rendered noteworthy service during the war. In 1917 he was in Washington as chairman of the National Advisory Committee for Aeronautics and vice-chairman of the National Research Council Committee on Engineering. He spent the following year in Paris as scientific attaché to the United States Embassy, representing the National Research Council, his responsibility being to maintain an interchange between Paris and Washington of technical and scientific information relating to war problems. He was also a member of the Interallied Commission on War Inventions.

As an inventor Dr. Durand probably is best known for his three-point caliper for determining true circular contours, and in authorship three books are to his credit. The latest of these, "Hydraulics of Pipe Lines," was published in 1921. More than 100 technical papers by him have been published in Government reports and the technical press.

Dr. Durand has been a member of the Society of Mechanical Engineers since 1883, serving as vice-president from 1911 to 1913. He is also a member of the American Institute of Electrical Engineers, the American Society of Naval Architects and Marine Engineers, and the American Society of Naval Engineers, which awarded him a gold medal and life membership in 1899. The Société Technique Maritime, the National Academy of Sciences, the American Academy of Sciences and the American Philosophical Society are other organizations in which he holds membership.

M. E. Farr resigned as president of the American Shipbuilding Co., Cleveland, at the annual meeting held in Jersey City on Oct. 8. He had previously announced his intention of retiring from the position. His successor has not yet been named. James A. Davidson was elected senior vice-president, secretary and treasurer. Mr. Farr has been associated with the lake shipbuilding industry for 32 years, and many of the large ore boats on the Great Lakes were built by his company. He was formerly associated with the Detroit Dry Dock Co. and was elected vice-president of the American Shipbuilding Co. in 1914. Later he succeeded Edward Smith as president.

W. L. Brown, president Pickands, Brown & Co., Chicago, recently returned to that city from his California home to spend a few weeks duck hunting with old friends. Mr. Brown, who is 81 years of age and in the best of health, is regarded as the dean of American pig iron merchants.

Frederick Stuyvesant Lust, formerly of Lust & Co., Inc., 220 Broadway, New York, has joined Karasik, Friedman & Co., Inc., 233 Broadway, New York as vice-president.

Mark J. Kelly, formerly associated with the Merchants Steel & Supply Co., Chicago, has joined the sales force of Hickman, Williams & Co. at Chicago.

D. A. Williston, Laclede-Christy Clay Products Co., St. Louis, will deliver an illustrated lecture on the "Use and Abuse of Refractories," before the Chicago Foundrymen's Club at the City Club, Chicago, Monday, Oct. 20.

James L. Gough, sales manager Stocker-Rumely-Wachs Co., machinery dealer, Chicago, has left for New Orleans, where he will spend the winter.

Frank C. Boes, formerly with the Jones-Smith Co., New York, has become associated with the Tucker Construction Co., Inc., general contractors, 103 Park Avenue, New York.

F. R. Whitecomb, secretary-treasurer Titusville Forge Works Co., Titusville, Pa., for the past eight years, has resigned, owing to ill health, and will spend the winter in Florida.

Wilbur C. Miller, editor in chief of the Syracuse *Journal*, Syracuse, N. Y., has resigned and will become general manager of the Flexible Machine Co., that city, manufacturer of flexible shafts.

O. J. H. Hartsuff, superintendent of the Edgar Thomson works, Carnegie Steel Co., Braddock, Pa., has been elected a director of the Braddock National Bank.

Martin G. Sperzel was elected vice-president and a director of the Royersford Foundry & Machine Co., Royersford, Pa., at the directors' meeting held Sept. 10. He succeeds H. R. Willi, retired. Mr. Sperzel also will assume new duties as general manager. He will continue in charge of sales, including machine tools, punch and shear machines, and tumbling barrels, which heretofore have been directed from the home office. He will remain in the Philadelphia office at 52 North Fifth Street.

Fred R. Low, editor of *Power* since 1888, and president of the American Society of Mechanical Engineers for 1924, received the degree of doctor of engineering from Rensselaer Polytechnic Institute, Troy, N. Y., last week, in connection with its centenary celebration. A well-deserved bestowment.

J. A. Gemerick has been appointed general manager of the Brightman Mfg. Co., Columbus, Ohio, manufacturer of shafting machinery, bolts and nuts. He will have charge of the plant, following the resignations as president and secretary of J. H. Replogle and J. P. Dods.

Michael H. Connelly, formerly sales agent for the American Car & Foundry Co., has resigned to become manager of sales for the Albany Car Wheel Co., Reading Car Wheel Co., and the General Steel Casting & Machine Co., with offices at 8 Lister Avenue, Newark, N. J.

Bruno V. Nordberg, Jr., executive engineer Nordberg Mfg. Co., Milwaukee, will be the principal speaker at the November meeting of the Engineers Society of Milwaukee, presenting Diesel engine practice. The talk will be illustrated with stereopticon slides.

Chester F. Smalley, for 14 years secretary and manager of the Smalley Mfg. Co., maker of agricultural implements, Manitowoc, Wis., has disposed of his entire interests to other stockholders and is retiring from active business to take up his future residence in Los Angeles, Cal.

H. Hobart Porter, member of the firm of Sanderson & Porter, 52 William Street, New York, has been elected to the board of trustees of Columbia University, New York. Mr. Porter, who was graduated from the Columbia Engineering Schools in 1886, is associated with numerous business enterprises, largely public utilities. He is a member of the executive committees of the Na-

tional Research Council and the Engineering Foundation.

J. F. Gaffney, for some time connected with the Willoughby, Ohio, plant of the Hadfield-Penfield Steel Co., has been appointed general foundry superintendent of the Toledo Machine & Tool Co., Toledo, Ohio.

William H. Woodin, president American Car & Foundry Co., New York, upon his return Oct. 8 from Europe said that his company finds business better now than early in the year, operating at 75 per cent capacity.

L. G. Pritz has been appointed vice-president in charge of all operations of the United Alloy Steel Corporation, Canton, Ohio. He was formerly superintendent of the electric furnaces of the Illinois Steel Co., later general superintendent of the steel works of the Timken Roller Bearing Co., Canton, Ohio, and recently vice-president of the Sizer Steel Corporation, Buffalo.

John W. Meaker, whose appointment as general manager of the Cyclone Fence Co., Waukegan, Ill., recently acquired by the United States Steel Corporation, was announced in THE IRON AGE of Oct. 9, started his business career in association with his father in the Meaker Mfg. Co., manufacturer of sheet metal products. This company was organized in Chicago 35 years ago and later moved to North Chicago, where it occupied a plant not far from the present site of the Cyclone Fence Co. It was later sold to the Fansteel Products Co. At that time Mr. Meaker took a clerical position with the American Steel & Wire Co. and for 25 years has been identified continuously with the company. He served in practically all sales departments of the organization and for two years was in charge of the St. Louis sales office. Returning to Chicago, he was appointed manager of the fence and post sales department, a position which he has held for the past 12 years. Mr. Meaker is succeeded in this position by H. A. Squibbs, who for the past eight years has been assistant manager of the department. Mr. Squibbs also has been with the American Steel & Wire Co. for 25 years, the past 18 of which have been spent in the sales department. He started work for the company as a puddler.

Indianapolis Industrial Exposition

INDIANAPOLIS, Oct. 11.—Exhibits of 18 steel and machinery manufacturers in Indianapolis featured the Second Indianapolis Industrial Exposition which was held here last week. Approximately 400 Indianapolis manufacturers had exhibits at the show, which was attended by 275,000 persons.

An outstanding exhibit was that of E. C. Atkins & Co., saw manufacturers, which included a full line of saws and two large shingle block circular saws, one 86 in. in diameter and the other 88 in. Another exhibit which attracted considerable attention was that of Hetherington & Berner, structural steel fabricators, of a model of a railway asphalt plant designed by C. F. Hetherington. A turret lathe shown by International Machine Tool Co. was the largest piece of machinery at the exposition. Sprockets and chains were displayed by the Diamond Chain & Mfg. Co., the Link-Belt Co. and the American High Speed Chain Co. The Insley Mfg. Co. exhibited a new motor driven excavator which it has recently started to manufacture.

Other machinery exhibitors and their exhibits were: Vonnegut Machinery Co., motor-driven molder; Sinker-Davis Co., manufacturers of wood working machinery, multiple cut-off sawing machine and upright boilers; U. S. Bearing Co., connecting rod and crankshaft bearings; Northwestern Machine Co., welding equipment; Dean Bros., pumps; Marschke Mfg. Co., motor-driven grinding machines; Van Camp Hardware & Iron Co., hardware; Central Wire & Iron Works, wire products; Universal Brass Works, fire fighting apparatus; Castle Refrigerating Co., refrigerators; Pioneer Brass Works, brass products.

OBITUARY

WILLIAM YAGLE, aged 77, for many years a prominent figure in the foundry industry in Pittsburgh, died at his home in that city, Oct. 7. He organized William Yagle & Co., Ltd., in 1883 and headed the company until 1912, when he sold out his interests to the Lawrence Foundry & Machine Co. and retired from active business. Before founding his own company, he was for a number of years associated with the Marshall Foundry Co. A charter member of the Pittsburgh Foundrymen's Association, he took an active part in the affairs of that organization, serving as president in 1898 and 1899 and for several years had been a trustee of the foundry fund of the association. Income of this fund is used for the technical education of young men in foundry practice. This was a work in which Mr. Yagle always was keenly interested. He was a Pittsburgh school director from 1885 until 1894. He was vice-president and a director of the Pennsylvania Savings Bank, Pittsburgh.

GEORGE WASHINGTON LYNDON, president of the Association of Manufacturers of Chilled Car Wheels, Chicago, died of heart disease at his home in that city on Oct. 8, aged 65 years.

CHARLES A. CARSCADIN, president National Car Equipment Co., Chicago, and vice-president Seamless Tube Co., Milwaukee, died Oct. 10, at the Palace Hotel, San Francisco. He was previously associated with the Michigan Central Railroad Co., with headquarters at Buffalo.

CHARLES WILLIAM CROSS, chief engineer of the Christopher & Simpson plant at St. Louis of the Mississippi Valley Structural Steel Co., died in St. John's Hospital in that city recently after a brief illness. Born in Kewanee, Ill., in 1870, he attended the University of Illinois and after graduating in 1892, he went with the Brown-Ketcham Iron Co. of which he became chief engineer upon the merger of the company with the Decatur Bridge Co. in 1922.

BENJAMIN F. BRANCH, sales manager Warren Axe & Tool Co., Warren, Pa., died at his home in that city on Oct. 4, following a short illness.

HENRY DWIGHT BABCOCK, founder and president Babcock Mfg. Co., Leonardsville, N. Y., maker of agricultural implements, died on Oct. 10 at Plainfield, N. J.

JOSEPH E. ELLISON, chief metallurgist and a director in the Ellison Brass Mfg. Co., Falconer, N. Y., died at his home in Jamestown, N. Y., Oct. 11, aged 49 years. With his brothers, Mr. Ellison founded the Ellison Brass company in 1915 and later formed the Ellison Bronze Mfg. Co.

Eyesight and Automobile Accidents

Attention is called by the Eyesight Conservation Council, Times Building, New York, to the fact that fatal automobile accidents are increasing at the rate of 2000 per year and injuries at the rate of 50,000 per year. With the realization that a large proportion of our population suffers from defective eyesight, the plea is made that particular caution be taken not to permit anyone to drive a car unless his vision is up to a reasonable standard. Only four States require such a test, these being Delaware, Minnesota, Oregon and Pennsylvania. Five other States make such a test, but without statutory requirements. A test in Detroit showed more than 26 per cent of automobile drivers with vision below the normal standard.

The Philadelphia & Reading Railroad shops at Reading, Pa., employing more than 4000 car builders, machinists and other workers, lengthened the working week from 40 hours, five days of eight hours each, to 45 hours, or 5½ days, effective Oct. 4. Until recently the shops were running only 32 hours per week.

Machinery Markets and News of the Works

IMPROVEMENT NOTED

Inquiry Continues Fair with Some from Export Sources

Shipbuilding Company in the Market—Used Equipment to Be Sold by Willys-Overland Co.

Although the market still has its dull spots, improvement is reported from practically all centers. Large orders are an exception, however, and buying has been from scattered sources. The volume of inquiry continues fair, some being for export. Further improvement is expected after election.

The Chesapeake & Ohio Railroad has begun purchasing against its recent list, and is expected to have another list ready before Jan. 1. The Norfolk & Western has issued an inquiry for two axle lathes.

The William Cramp & Sons Ship & Engine Building Co. is in the market for a number of heavy tools. The Navy Department is taking bids on eight engine lathes.

The Ajax Motors Co., Racine, Wis., which has purchased recently a 42 x 54 in. planer, is expected to place considerable equipment within the next few weeks.

The Standard Sanitary Mfg. Co. bought a number of turret lathes and grinders for its Louisville plant last week, but still has a few items to buy.

The Louisville & Nashville Railroad closed for the tools on its smaller list, and the Big Four is reported to have about completed its purchases.

The White Motor Co. placed several machines during the week against its recent inquiry for 15 tools for its experimental department.

The Allis-Chalmers Mfg. Co., acting for a Mexican client, has placed orders for four machines and a quantity of small tools.

A large lot of used machinery, including 750 surplus machine tools, will be sold at public auction by the Willys-Overland Co. They will be auctioned at Elyria, Ohio, Oct. 21 and 22, and at Toledo, Oct. 23 and 24.

New York

New York, Oct. 14.

THERE is comparatively little important activity in the local machine-tool trade. The view is held by most sellers that no real improvement may now be expected until after election. The fact is that machine-tool sales have shown an upward trend since mid-summer but the gain has been so slight as scarcely to be noticed, and the Eastern territory is not furnishing as much business as some other sections of the country. Among recent sales of tools are: A 69-in. driving-wheel lathe to the Long Bell Lumber Co., Seattle, Wash.; four 48-in. car-wheel borers to the Pullman Car & Mfg. Corporation; an axle lathe to the Kilby Car & Foundry Co., Birmingham; a 5-ft. radial drill to the Pennsylvania Railroad.

The Bureau of Supplies and Accounts, Washington, is asking bids until Oct. 21 for drills, chisels, dies, files, wrenches, wrench sets, hammers, etc., for the Brooklyn and Mare Island Navy Yards, schedule 2755; 75 forced lubrication oil gages, 115 vacuum gages, 102 steam and vacuum gages, and 103 steam gages for the Brooklyn Navy Yard; 40 forced lubrication oil gages for the Boston Navy Yard and 40 similar gages for the Puget Sound Yard, schedule 2737.

Maher, Ward & Meeter, 431 West Fourteenth Street, New York, architects, have completed plans for a two-story automobile service, repair and garage building, 90 x 110 ft., at 363-71 West Twelfth Street, estimated to cost $75,000 with equipment.

The Pan-American Petroleum & Transport Co., 120 Broadway, New York, is disposing of a bond issue of $12,000,000, a portion of the proceeds to be used for extensions and improvements in refineries, etc., and for financing in connection with the Mexican Petroleum Co., Ltd., a subsidiary. E. L. Doheny is chairman of the board.

M. Tejera Piegnard, Arzobisto Merino 46, Santo Domingo, West Indies, has inquiries out for machinery for the manufacture of corrugated paper boxes, including cutting, forming, etc.

The Board of Education, 500 Park Avenue, New York, has plans for a one-story pumping plant at 3719-3801 Bedford Avenue, Brooklyn, to cost about $21,000. William H. Gompert, Flatbush Avenue and Concord Street, Brooklyn, is architect.

The Modern Wire Frame Co., 412 East Twenty-third Street, New York, is considering the purchase of an electric spot welding machine.

The Government of the State of Pernambuco, Brazil, Public Works Department, is planning for the establishment of a general machine and repair shop at Recife, and purposes to remodel the Sacramento Building for this purpose. The American Consulate, Pernambuco, Fred C. Eastin, Jr., vice-consul, has information regarding the project, also data at the Bureau of Foreign and Domestic Commerce, Washington, Reference 143614.

The George Haiss Mfg. Co., Rider Avenue and 141st Street, New York, manufacturer of elevating and conveying equipment, will build a one-story addition, 150 x 224 ft., estimated to cost $22,000.

Cannava & Viviano, 47 West Forty-second Street, New York, architects, have plans for a two-story automobile service, repair and garage building, 100 x 150 ft., on East Ninetieth Street, to cost $80,000, for which bids will be taken on a general contract.

Joseph Stolz & Son, Inc., Commerce Avenue and 170th Street, New York, operating a steel and iron works, has inquiries out for flange steel plates of different sizes.

The Ice Service Co., Inc., 68 Ninth Avenue, New York, operating ice-manufacturing plants, is disposing of a bond issue of $1,000,000, the proceeds to be used for expansion, particularly in connection with a new plant on Fortieth Street. James Pringle is president.

The American Can Co., 120 Broadway, New York, is said to be planning for the construction of an addition to its works at Seattle, Wash., to double approximately the present capacity, estimated to cost $1,000,000 with equipment.

The Victorian Government Railway Department, Melbourne, Australia, office of the secretary, is asking bids for 462 cwt. copper plates for engine service, to be received until Nov. 5.

The Board of Education, Walden, N.Y., is considering the installation of manual training equipment in the proposed new combination high and grade school, estimated to cost $200,000, for which it is expected to ask bids on general contract in about 90 days. G. Betz, 286 Wall Street, Kingston, N. Y., is architect.

The Newark Sugar Refining Co., Newark, N. J., organized a number of months ago by Adolph Segal, Pennsylvania Building, Philadelphia, and associates, has closed negotiations with the local department of public works for the purchase of about 6¾ acres in the vicinity of Terminal Street, Port Newark, as a site for a proposed sugar refinery, to cost $250,000 with machinery. Plans for the initial unit will be prepared at an early date.

The New Jersey Blower & Mfg. Co., 179-81 Ogden Street, Newark, has awarded a general contract to the Sutherland-Allen Co., 14 Park Place, for a one and one-half story addition, estimated to cost $20,000. George E. Jones, Union Building, is architect.

Buffalo

BUFFALO, Oct. 13.

NEGOTIATIONS have been closed by the Atterbury Motor Car Co., Elmwood and Hertel Avenues, Buffalo, for the purchase of about 3 acres at the rear of its present plant for proposed additions. J. R. Spraker is vice-president and general manager.

Motors, controls, conveying machinery, factory trucks and other equipment will be installed in the four-story addition to be erected to the printing plant of the *Buffalo Evening News*, 63 Pearl Street, Buffalo, 63 x 132 ft., estimated to cost $150,000. Plans have been filed.

Manual training equipment will be installed in the two-story high school to be erected at Rome, N. Y., estimated to cost $400,000, for which bids will be received on a general contract until Oct. 21. Tooker & Marsh, 101 Park Avenue, New York, are architects.

The Seneca Engineering Co., Carter Building, Rochester, N. Y., has taken a contract for a two-story automobile service, repair and garage building, 66 x 145 ft., estimated to cost $37,000. Peter Drago, 300 Central Park, is architect.

The Rochester Gas & Electric Corporation, Rochester, N. Y., has engaged Chester W. Smith, Newburyport, Mass., construction engineer, to prepare plans for the proposed dam on the Genesee River, near Mount Morris, N. Y., for a hydroelectric generating project, estimated to involve about $9,000,000.

Cincinnati

CINCINNATI, Oct. 13

WHILE the machinery market still has its dull spots, the number of orders booked shows considerable improvement. Buying is widely scattered and export inquiries as well as domestic continue in good volume. It is noticeable, however, that large orders are one exception. The Standard Sanitary Mfg. Co., which has been purchasing for its Louisville plant, bought a number of turret lathes and grinders last week and still has a few items to buy.

The Louisville & Nashville Railroad closed for the tools on its smaller list, and the Big Four has about completed its purchases, taking two radial drills. The St. Louis Southwestern bought two gap lathes and the Navy Department two large engine lathes. The Chesapeake & Ohio Railroad has begun its purchases again the recent list, but is expected to have another list ready by the first of the year. The Norfolk & Western issued an inquiry for two axle lathes and the William Cramp & Sons Ship & Engine Building Co. is in the market for a number of heavy tools. The Navy Department is taking bids on eight engine lathes.

The Modern Foundry Co., Cincinnati, is making alterations to its plant to more efficiently produce castings for the machine tool industry. Among new equipment to be installed is a 20-ton electric overhead traveling crane. New annealing ovens also will be installed. W. H. Geier is president.

The Superior Gas Engine Co., Springfield, Ohio, which recently purchased the plants of the Motorenfabrik Co., Cologne, Germany, and the Otto Engine Works, Philadelphia, is having plans prepared for an addition to its Springfield plant. The company will manufacture Diesel engines, the larger sizes to be made at Springfield and the smaller ones at Philadelphia. In addition, operations will be continued at the German plants. P. J. Shouvlin is president of the company.

The Woodward Gear Co., Wooster, Ohio, has purchased the plant of the Tri-State Engineering Co., Zanesville, Ohio, which had been under lease to the Youngstown Sheet & Tube Co. It is understood that the new owners will operate the plant in the manufacture of boilers and engines.

The Power Mfg. Co., Marion, Ohio, has plans under way for the erection of an office and factory building, work on which is expected to begin this fall. Hall & Lethly, Springfield, Ohio, are the engineers.

The Columbus Silvering & Beveling Co., Columbus, Ohio, with plant at 278-84 North Third Street, has engaged Jacob Goldsmith, Nims Building, architect, to prepare plans for its three-story and basement factory, 40 x 120 ft., at 100-102 East Goodale Street, estimated to cost $32,000. Edgar C. Hill is president and general manager.

The Memphis Power & Light Co., Memphis, Tenn., has arranged for a preferred stock issue of $490,000, a portion of the proceeds to be used for extensions and improvements.

The Perfect Fly-Exit Screen Co., Paducah, Ky., has acquired a building on Bridge Street, and will remodel for the manufacture of screens, screen doors, etc., with equipment installation estimated to cost $40,000. It is understood that a contract for a portion of the machinery has been let to the Yates Co., Beloit, Wis. T. A. Miller is president.

Philadelphia

PHILADELPHIA, Oct. 13.

PLANS are being arranged by the Crew Levick Co., 219 North Broad Street, Philadelphia, oil refiner, for additions to its storage and distributing works at the Petty Island terminal to cost $250,000 with machinery. The company is operated by Henry L. Doherty & Co., 60 Wall Street, New York.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until Oct. 21 for cutting and welding torches, regulators and discharge valves for the Philadelphia, Brooklyn and Mare Island Navy Yards, schedule 2758.

The American Wood Turning Co., 715 North Eighth Street, Philadelphia, has acquired factory property at 144-46 Noble Street and 446-50 New Market Street, for $42,000 for extensions.

Plans are nearing completion for the proposed lumber terminal and distributing plant to be erected by the Lumbermen's Exchange of Philadelphia, Crozier Building, and affiliated interests on a tract of 88 acres, comprising a portion of the former Hog Island property. It will include power house and machine shops. The complete project will involve $20,000,000.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: 42,700, from Jorge Nunez Z, Cartagena, Colombia, desiring to get in touch with American manufacturers of enameled iron plates for designating street names, automobile licenses, etc.; 42694, from Sobrinos de Izquierdo & Co., San Juan, Porto Rico, interested in reaching manufacturers of corrugated iron roofing sheets, barbed wire, nails, enameled ware, etc.; 42699, from Luis de Torres, Segovia 39, Madrid, Spain, desiring to get in touch with American manufacturers of bars, sheets, rods, plates, tubing, spare parts for typewriters, screw dies, taps, reamers, files, tools and hardware products, metal saws, etc.; 42689, from S. M. Kundu & Sons, 49 Bentinck Street, Calcutta, India, desiring to reach American manufacturers of galvanized corrugated sheets, plain iron sheets, iron plates, etc.; 42708, from R. Garcia Reigada, 51 Salvador Brau Street, San Juan, Porto Rico, desiring to get in touch with American manufacturers of wire netting, wire cloth, enameled ironware, etc.; 42690, from Carlos A. Tellez, Manzana de Gomez 564, Havana, Cuba, wishing to get in contact with manufacturers of bicycles, parts and accessories, fittings, etc.

The General Asphalt Co., Land Title Building, Philadelphia, has arranged for a bond issue of $5,000,000, a portion of the proceeds to be used for extensions and improvements. Arthur W. Sewall is president.

The School Board, York, Pa., has revised plans for its proposed two-story and basement industrial high school at Beaver Street and College Avenue, estimated to cost $850,000 with equipment, and expects to ask bids soon on a general contract. Hamme & Witman, City Bank Building, are architects. David Crider is secretary.

The Penn Central Light & Power Co., Altoona, Pa. has acquired the plant and property of the Home Electric Light & Steam Heating Co., Tyrone, Pa., a subsidiary of the Altoona & Logan Valley Electric Railway Co., and will extend its power facilities in this section.

The Philadelphia & Reading Railway Co., Reading Terminal, Philadelphia, has preliminary plans for enlargements in its car and locomotive shops at Reading, Pa.

Edward W. Peters, 103 Lower Mulberry Street, Danville, Pa., has inquiries out for a locomotive crane, 15 to 20 tons capacity, 8-wheel, 50-ft. boom, with double drum; also for one low pressure centrifugal pump, 350 gal. per min. capacity, belt-driven, complete with shaft, pulleys, etc.; one emery bench grinder and one emery flexible shaft grinder; one expansion reamer; one natural gas engine, 75 hp., complete with starting outfit, clutch for driving high pressure pump and pulley for driving low pressure pump, and number of 15-in. 40 lb. I-beams, lengths 20 to 40 ft.

Ovens, power equipment, conveying and other machinery will be installed in the four-story plant, 50 x 150 ft., to be erected by the Williams Bakery, Scranton, Pa., estimated to cost $100,000, for which a general contract has been let

The Crane Market

FEW new crane inquiries or orders are reported this week. The outstanding inquiry in the New York district is the request for prices by Thomas E. Murray, Inc., 55 Duane Street, New York, on two 200-ton overhead cranes for the New York Edison Co. The 25 hand power hoists on which the Department of Street Cleaning, City of New York recently opened bids is still pending. The Department of Water Supply, Gas and Electricity, City of New York, will probably issue a formal call for bids early next month on a 5-ton hand power crane. The Public Service Production Co., Newark, N. J., recently in the market for a large steel erection crane, has rented a 50-ton Industrial from Philip T. King, New York. A 1-ton capacity electric industrial truck, equipped with a small boom having a 12-ft. radius for lifting, is being asked for by Yamatake Co., 40 Rector Street, New York, for export. Thomas J. Pope, 50 Church Street, New York, is asking for a used 10-ton, 30-ft. span, electric traveling crane for use in Boston.

There is an improvement in the volume of inquiry in the Pittsburgh district although sales are few. Within a few days it is expected that the Carnegie Steel Co. will close on a 15-ton floor operated crane for the power house at its Mingo works. Prices for estimating have been asked on a list of nine cranes by a Pittsburgh district steel manufacturer.

Among recent purchases are:

Youngstown Sheet & Tube Co., a 5-ton, 85-ft. span gantry bridge, without hoist, from an Eastern builder.

Fulton Light, Heat & Power Co., Fulton, N. Y., a 10-ton geared trolley and a 10-ton chain block from the Reading Chain & Block Corporation.

Northwestern Mining & Exchange Co., Chicago, two 5-ton, 20-ft. and 29-ft. span, from the Reading Chain & Block Corporation.

New Jersey Zinc Co., Franklin Furnace, N. J., is reported to have closed on two 2-ton hand power cranes with electric bridge travel.

Caddo River Lumber Co., Rosboro, Ark., a 5-ton locomotive crane for log loading from the American Hoist & Derrick Co.

Stone & Webster, Inc., Boston, reported to have closed on the 75-ton overhead crane for the Luzerne County Gas & Electric Co., with the Northern Engineering Works.

Westinghouse Electric & Mfg. Co., a 5-ton overhead traveling crane from the Northern Engineering Works.

City of Buffalo, a 10-ton, 45-ft. span overhead crane for pumping station of filtration plant, from the Northern Engineering Works.

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to the Turner Construction Co., 11 Goodell Street, Buffalo. Paul Williams is president.

The State Motors Co., Harrisburg, Pa., has leased a two-story structure, 80 x 120 ft., to be erected on Cameron Street, by C. S. Humphreys and associates, for a service, repair and garage building, to cost $75,000. A general contract has been let to the Austin Co., 1015 Chestnut Street, Philadelphia.

Manual training equipment will be installed in the three-story and basement high school to be erected at Hazelton, Pa., estimated to cost $600,000, for which plans will be drawn by Lawrie, Green & Co., 116 Locust Street, Harrisburg, Pa., architects.

Bids will be received by the United States Engineer, Schaff Building, Philadelphia, until Oct. 22 for two 20-in. centrifugal pumps and accessories, circular 64.

Cleveland

CLEVELAND, Oct. 13.

THE machine tool market is showing a slight improvement. Orders are still largely for single tools and as a rule to replace old equipment. The White Motor Co. purchased several machines during the week against its recent inquiry for 12 to 15 tools for its experimental department. The Reeves Brothers Co., Alliance, Ohio, bought a number of used tools for its repair shop. The Kansas City Southern Railroad placed a large turret lathe with a Cleveland manufacturer, the third single machine order from this source in a few weeks. A local manufacturer of automatic screw machinery reports a better volume of single machine orders and a marked improvement in inquiries for single tools and small lots. These are coming from various sources outside of the automobile field. Very little business in any line of equipment is coming at present from the automotive industry.

One of the largest lots of used machinery to be placed on the market in this territory for some time will be sold at public auction by the Willys-Overland Co. and includes about 750 surplus machine tools from its various plants. A portion of these will be auctioned at Elyria Oct. 21 and 22 and the remainder at Toledo, Oct. 23 and 24.

The India Tire & Rubber Co., Mogadore, Ohio, contemplates the erection of a factory building, probably three stories, 60 x 160 ft.

The Champion Spark Plug Co., Toledo, has taken bids on a one-story brick factory, 65 x 160 ft.

The Harris Automatic Press Co., 4510 East Seventy-first Street, Cleveland, manufacturer of printing presses, has placed contract with the H. K. Ferguson Co., Cleveland, for a one-story factory, 55 x 111 ft.

The Worthington Ball Co., Elyria, Ohio, manufacturer of golf balls, is having plans prepared for a two-story addition.

The Barnes Motor Co., 1938 East Twenty-first Street, Cleveland, has awarded a contract for a 100 x 135 ft. repair shop and automobile sales and service station on Wire Avenue. The estimated cost is $150,000.

The Angell Nail & Chaplet Co., 1657 East Seventy-ninth Street, Cleveland, contemplates the erection of a new and larger plant on East Seventy-first Street.

The Miller Keyless Lock Co., Kent, Ohio, contemplates a factory addition. J. B. Miller is president and James P. Miller, secretary and treasurer.

The Board of Education of Atwater Township, Atwater, Ohio, contemplates the erection of a high school to include manual training shops. A bond issue of $75,000 will be voted on Nov. 4. E. E. Strong is clerk of the Board of Education.

Power equipment, ovens, conveying machinery and other equipment will be installed in the three-story plant to be erected by the Tri-State Baking Co., Toledo, Ohio, on 3-acre site on Curtis Street, recently acquired, estimated to cost $500,000. It is purposed to remove the present plant at Walnut and Summit Streets to the new location. The McCormick Co., Inc., 121 South Negley Street, Pittsburgh, is architect and engineer.

The Art Iron & Metal Works, Canton Street, Toledo, Ohio, is having plans drawn for a new one-story plant, estimated to cost $90,000 with machinery. Mills, Rhines, Bellman & Nordhoff, Toledo, are architects.

Chicago

CHICAGO, Oct. 13.

MACHINE tool buying shows some improvement, although the restraining influence of politics is still felt. Purchases by the Chicago Board of Education for local high schools have been completed, the group of orders placed a week ago involving $75,000. In addition to the machines mentioned in THE IRON AGE of Oct. 9, the following tools were among those ordered: Four centering machines, two 24-in. upright drills, three universal motor-driven cutter and tool grinders, and seven speed lathes. The railroads have made no new moves in the direction of machine tool purchases, but dealers are hopeful that lists will appear within a few weeks.

The Ajax Motors Co., Racine, Wis., which is expected to buy considerable equipment within the next few weeks, has thus far closed for a 42 x 54-in. x 10-ft. planer with two heads on the cross rail and a side head, arranged for reversing motor drive. Acting for a Mexican client, the Allis-Chalmers Mfg. Co., West Allis, Wis., has placed orders for a 6-in. pipe machine, a 4-ft. radial drill, a 20-in. shaper, a 2½-in. electric drill and a quantity of small tools. The Great Lakes Valve Corporation, Elgin, Ill., has purchased a swaging machine and die head equipment, and the Chicago Rapid Transit Co. is inquiring for a 6 x 6-in. motor-driven hack saw.

The Sherwood Mfg. Co., 2100 26 Fifty-second Avenue, Cicero, Ill., incorporated with $150,000 capital stock, has a fully equipped plant with two and one-half acres of floor space at the address given and manufactures saws and

hardware specialties. L. S. Sherwood is president and treasurer, and Irving S. Adler is secretary.

The Tuthill Spring Co., 754-778 Polk Street, Chicago, has erected at 759-69 Polk Street, Chicago, opposite its present spring factory, a one-story building, 78 x 128 ft., to be used for repairing automobile springs, taking them off and replacing them on vehicles.

The Rosenbloom Cooperage Co., 1030 North Branch Street, Chicago, will erect a plant covering one-half of a 152 x 300-ft. tract recently purchased at the corner of Grand Avenue and Spaulding Street.

The Union Pacific System contemplates the construction of a one-story power plant at Huntington, Ore., to cost $25,000.

Bids will soon be called for a one-story and basement addition to the plant of the Charter Gas Engine Co., Sterling, Ill., to cost $45,000 with equipment. Frank D. Chase, Inc., 725 North Michigan Avenue, Chicago, is architect and engineer. W. A. Robinson is president and general manager.

The Progress Mfg. Co., Arthur, Ill., has inquiries out for a circular shear.

The Domestic and Foreign Commerce Department, Chicago Association of Commerce, 10 South La Salle Street, has received the following inquiries: 4094, from a company at Havana, Cuba, desiring to get in touch with American manufacturers of sugar mill machinery and supplies; 4098, from a concern at London, England, in the market for drag line excavators; and 4095, from a company at Swatow, China, desiring to get in contact with American manufacturers of industrial machinery, tools, electrical equipment and hardware.

The Common Council, Jonesboro, Ill., will soon call for bids for equipment for a municipal waterworks, including pumping machinery, steel tank and tower, and accessory apparatus. The W. A. Fuller Co., Railway Exchange Building, St. Louis, is engineer.

The Enterprise Boiler & Tank Works, 2308 Wabansia Avenue, Chicago, has awarded a general contract to Charles Laken, 606 South Dearborn Street, for a new one-story and part basement boiler and tank plant at 1955-67 North Long Avenue, 50 x 140 ft., for which foundations will be laid immediately. Gallup & Joy., Inc., 646 North Michigan Avenue, is architect and engineer.

Fire, Oct. 6, destroyed a portion of the box manufacturing works and other departments at the meat-packing plant of the Cudahy Packing Co., Southside, Omaha, Neb., with loss estimated at $250,000 including equipment. Plans for rebuilding are under consideration.

The Red River Sugar Co., 416 Oak Grove Street, Minneapolis, Minn., will soon ask bids on a general contract for its proposed beet sugar refining plant at East Grand Forks, Minn., with power house and machine shop, to cost in excess of $300,000. H. A. Douglas is president.

The Pullman Car & Mfg. Corporation, Pullman Building, Chicago, has asked for bids on a passenger car finishing plant at its works, Pullman, Ill., to cost $500,000. It will be a one-story structure, 284 x 484 ft.

The Bates Expanded Steel Truss Co., East Chicago, Ind., contemplates the construction of further additions. The abandonment of Pittsburgh plus has strengthened the company's position for the manufacture of steel electric transmission towers and equipment.

The Enterprise Boiler & Tank Works, 2308 Wabansia Avenue, Chicago, has awarded contract for a one-story boiler and tank shop, 50 x 143 ft., 1955-67 North Long Avenue, to cost $30,000.

John Rissman & Son, 841 Blue Island Avenue, Chicago, have awarded contract for a one-story and part basement garage and automobile repair shop, 50 x 120 ft., 847 Blue Island Avenue, to cost $18,000.

The Mather Stock Car Co., Chicago, is inquiring for a used or new table shear for cutting galvanized sheets up to 8 ft. wide and 16 gage.

Milwaukee

MILWAUKEE, Oct. 13.

THE machine-tool trade is improving although progress is slow. Production in this center has gained somewhat, owing to an improved call for milling machines, largely from the automotive industries. Employment has shown further gains since Oct. 1, which is accepted as a hopeful sign of continued betterment in the situation.

The National Tool & Machine Co., Racine, Wis., has started work on a shop extension on Clark Street estimated to cost $25,000, including equipment.

The Drop-Head Projector Corporation, Fond du Lac, Wis., has been incorporated with a capital of $125,000 preferred and 6250 shares of common without par value, to manufacture portable motion picture outfits. The principals are A. F. Zarlock, F. Kastorff and W. H. Tennant, who have acquired the entire assets of the defunct Drop Head Projector Co., Fond du Lac, and are placing the plant in operation. Some retooling is being done.

The Wisconsin Incubator Co., Racine, Wis., will build a two-story addition, 40 x 100 ft., at Eighteenth Street and Holborn Avenue, and is now taking bids through J. Mandor Matson, local architect. With equipment it will cost about $45,000.

The Aluminum Specialty Co., Manitowoc, Wis., has awarded the general contract to William H. Mielke, local builder, for enlarging its branch plant at Chilton, Wis. An investment of about $25,000 is planned. Walter Spindler is president and general manager.

The Common Council, Elkhorn, Wis., has placed the general contract for building and equipping a sewage disposal plant to the Covell Engineering Co., Kenosha, Wis.

The Frank Hamachek Machine Co., Kewaunee, Wis., has been incorporated with an authorized capitalization of $500,000, organized by Frank Hamachek, Sr., A. Hamachek and Frank Hamachek, Jr., to take over and develop further an agricultural implement and tool works maintained at Kewaunee for many years as a partnership. An improvement program with respect to plant and equipment is being undertaken which is expected to result in the purchase of considerable new equipment within the coming year.

The Wright Rubber Products Co., Racine, Wis., has started work on a $30,000 addition, principally for the production of paving blocks and materials from a composition with reclaimed rubber as a base. Clarence E. Wright is president and general manager.

Herman J. Esser, architect, 80 Wisconsin Street, Milwaukee, has plans for a three-story manufacturing building, 50 x 350 ft. The exact location and the name of the owner and occupant are withheld for the present. Contracts will be awarded in about a week.

The Green Bay, Wis., Foundry & Machine Works, for nine years manufacturing water filters for paper and pulp mills, is enlarging its activities to include machinery for canning factories, to reclaim waste for by-products and prevent contamination of streams. The new machine is made in four sizes, ranging from 100,000 to 1,000,000 gal. capacity. Ray North is general manager.

The Chicago, Milwaukee & St. Paul Railway Co., Chicago, has announced its intention of replacing one of the two grain elevators destroyed by fire within the past year at Milwaukee, with a reinforced concrete house having a capacity of 1,500,000 bu., and a capacity for handling 35 to 40 cars daily. Preliminary plans and estimates are being prepared by the company's engineering staff and details probably will be ready by Dec. 1. C. F. Loweth, Chicago, is chief engineer.

W. H. O'Toole, 110 North Fourth Street, LaCrosse, Wis., is reported in the market for several punch presses and die equipment.

New England

BOSTON, Oct. 13.

WITH October practically half spent, business in the machine tool trade, compared with the corresponding period last month, is approximately 65 per cent improved. Sales so far, however, have not been distributed generally among machine tool dealers, only a few houses figuring in the bulk of transactions. While the percentage of increase is large it does not even suggest real activity, but rather a good recovery from a depression which has not been experienced by the trade in years. The buying comes from diversified industries, yet purchases in most instances have been confined to one or two machines, partly new and partly used, the latter predominating largely because of their good condition and the disparity of prices with new machinery. Another encouraging feature is that inquiries for machinery are coming from Europe and the Pacific Coast.

The Bettinger Enamel Corporation, River Street, Waltham, Mass., contemplates the erection of a one-story, 72 x 80 ft. plant on Pleasant Street, near the city line.

Bids will be asked about Oct. 25 for a New Bedford, Mass., high school addition to cost approximately $200,000, three-stories, 152 x 226 ft. Some 60 electric motors will

Longest Suspension Bridge Span Closed

WHEN Ex-Governor Benjamin B. Odell, Newburgh, N. Y., Drove the Last Rivet Completing the Structural Work on the Approaches to the Bear Mountain Bridge, the Longest Span of Any Suspension Bridge in the World Was Closed. The span is 1623 ft., compared with 1600 ft. in the Williamsburg Bridge, the present longest completed suspension bridge. Both will be exceeded when the Philadelphia-Camden Bridge is finished, but for the present the Bear Mountain Bridge is the longest. It is anticipated that it will be ready for use in January next. It will be a highway bridge without provision for either railroads or trolley cars and is the only highway bridge crossing the Hudson South of Albany.

be required for a machine shop department. Brown & Poole, 688 Pleasant Street, New Bedford, are the architects.

Foundations are being laid for a manufacturing plant, garage and ice house on Webster and Eastern Avenues, Lynn, Mass., for the Jersey Ice Cream Co., Lawrence, Mass., to cost, including equipment, $100,000. Ashton, Huntress & Alter, 477 Essex Street, Lawrence, are the architects. Conveying equipment is required.

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The Reifling Auto Co., 2331 South Jefferson Street, St. Louis, will build by day labor a two-story service and repair building, 75 x 120 ft., to cost $80,000 with equipment. E. J. Hess, 3228 Magnolia Avenue, is architect.

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The Durand Hoop Co., Durand, Mich., has tentative

hardware specialties. L. S. Sherwood is president and treasurer, and Irving S. Adler is secretary.

The Tuthill Spring Co., 754-778 Polk Street, Chicago, has erected at 759-69 Polk Street, Chicago, opposite its present spring factory, a one-story building, 78 x 128 ft., to be used for repairing automobile springs, taking them off and replacing them on vehicles.

The Rosenbloom Cooperage Co., 1030 North Branch Street, Chicago, will erect a plant covering one-half of a 152 x 300-ft. tract recently purchased at the corner of Grand Avenue and Spaulding Street.

The Union Pacific System contemplates the construction of a one-story power plant at Huntington, Ore., to cost $25,000.

Bids will soon be called for a one-story and basement addition to the plant of the Charter Gas Engine Co., Sterling, Ill., to cost $45,000 with equipment. Frank D. Chase, Inc., 725 North Michigan Avenue, Chicago, is architect and engineer. W. A. Robinson is president and general manager.

The Progress Mfg. Co., Arthur, Ill., has inquiries out for a circular shear.

The Domestic and Foreign Commerce Department, Chicago Association of Commerce, 10 South La Salle Street, has received the following inquiries: 4094, from a company at Havana, Cuba, desiring to get in touch with American manufacturers of sugar mill machinery and supplies; 4098, from a concern at London, England, in the market for drag line excavators; and 4095, from a company at Swatow, China, desiring to get in contact with American manufacturers of industrial machinery, tools, electrical equipment and hardware.

The Common Council, Jonesboro, Ill., will soon call for bids for equipment for a municipal waterworks, including pumping machinery, steel tank and tower, and accessory apparatus. The W. A. Fuller Co., Railway Exchange Building, St. Louis, is engineer.

The Enterprise Boiler & Tank Works, 2308 Wabansia Avenue, Chicago, has awarded a general contract to Charles Laken, 606 South Dearborn Street, for a new one-story and part basement boiler and tank plant at 1955-67 North Long Avenue, 50 x 140 ft., for which foundations will be laid immediately. Gallup & Joy., Inc., 646 North Michigan Avenue, is architect and engineer.

Fire, Oct. 6, destroyed a portion of the box manufacturing works and other departments at the meat-packing plant of the Cudahy Packing Co., Southside, Omaha, Neb., with loss estimated at $250,000 including equipment. Plans for rebuilding are under consideration.

The Red River Sugar Co., 416 Oak Grove Street, Minneapolis, Minn., will soon ask bids on a general contract for its proposed beet sugar refining plant at East Grand Forks, Minn., with power house and machine shop, to cost in excess of $300,000. H. A. Douglas is president.

The Pullman Car & Mfg. Corporation, Pullman Building, Chicago, has asked for bids on a passenger car finishing plant at its works, Pullman, Ill., to cost $500,000. It will be a one-story structure, 284 x 484 ft.

The Bates Expanded Steel Truss Co., East Chicago, Ind., contemplates the construction of further additions. The abandonment of Pittsburgh plus has strengthened the company's position for the manufacture of steel electric transmission towers and equipment.

The Enterprise Boiler & Tank Works, 2308 Wabansia Avenue, Chicago, has awarded contract for a one-story boiler and tank shop, 50 x 143 ft., 1955-67 North Long Avenue, to cost $30,000.

John Rissman & Son, 841 Blue Island Avenue, Chicago, have awarded contract for a one-story and part basement garage and automobile repair shop, 50 x 120 ft., 847 Blue Island Avenue, to cost $18,000.

The Mather Stock Car Co., Chicago, is inquiring for a used or new table shear for cutting galvanized sheets up to 8 ft. wide and 16 gage.

Milwaukee

MILWAUKEE, Oct. 13.

THE machine-tool trade is improving although progress is slow. Production in this center has gained somewhat, owing to an improved call for milling machines, largely from the automotive industries. Employment has shown further gains since Oct. 1, which is accepted as a hopeful sign of continued betterment in the situation.

The National Tool & Machine Co., Racine, Wis., has started work on a shop extension on Clark Street estimated to cost $25,000, including equipment.

The Drop-Head Projector Corporation, Fond du Lac, Wis., has been incorporated with a capital of $125,000 preferred and 6250 shares of common without par value, to manufacture portable motion picture outfits. The principals are A. F. Zarlock, F. Kastorff and W. H. Tennant, who have acquired the entire assets of the defunct Drop Head Projector Co., Fond du Lac, and are placing the plant in operation. Some retooling is being done.

The Wisconsin Incubator Co., Racine, Wis., will build a two-story addition, 40 x 100 ft., at Eighteenth Street and Holborn Avenue, and is now taking bids through J. Mandor Matson, local architect. With equipment it will cost about $45,000.

The Aluminum Specialty Co., Manitowoc, Wis., has awarded the general contract to William H. Mielke, local builder, for enlarging its branch plant at Chilton, Wis. An investment of about $25,000 is planned. Walter Spindler is president and general manager.

The Common Council, Elkhorn, Wis., has placed the general contract for building and equipping a sewage disposal plant to the Covell Engineering Co., Kenosha, Wis.

The Frank Hamachek Machine Co., Kewaunee, Wis., has been incorporated with an authorized capitalization of $500,000, organized by Frank Hamachek, Sr., A. Hamachek and Frank Hamachek, Jr., to take over and develop further an agricultural implement and tool works maintained at Kewaunee for many years as a partnership. An improvement program with respect to plant and equipment is being undertaken which is expected to result in the purchase of considerable new equipment within the coming year.

The Wright Rubber Products Co., Racine, Wis., has started work on a $30,000 addition, principally for the production of paving blocks and materials from a composition with reclaimed rubber as a base. Clarence E. Wright is president and general manager.

Herman J. Esser, architect, 80 Wisconsin Street, Milwaukee, has plans for a three-story manufacturing building, 50 x 350 ft. The exact location and the name of the owner and occupant are withheld for the present. Contracts will be awarded in about a week.

The Green Bay, Wis., Foundry & Machine Works, for nine years manufacturing water filters for paper and pulp mills, is enlarging its activities to include machinery for canning factories, to reclaim waste for by-products and prevent contamination of streams. The new machine is made in four sizes, ranging from 100,000 to 1,000,000 gal. capacity. Ray North is general manager.

The Chicago, Milwaukee & St. Paul Railway Co., Chicago, has announced its intention of replacing one of the two grain elevators destroyed by fire within the past year at Milwaukee, with a reinforced concrete house having a capacity of 1,500,000 bu., and a capacity for handling 35 to 40 cars daily. Preliminary plans and estimates are being prepared by the company's engineering staff and details probably will be ready by Dec. 1. C. F. Loweth, Chicago, is chief engineer.

W. H. O'Toole, 110 North Fourth Street, LaCrosse, Wis., is reported in the market for several punch presses and die equipment.

New England

BOSTON, Oct. 13.

WITH October practically half spent, business in the machine tool trade, compared with the corresponding period last month, is approximately 65 per cent improved. Sales so far, however, have not been distributed generally among machine tool dealers, only a few houses figuring in the bulk of transactions. While the percentage of increase is large it does not even suggest real activity, but rather a good recovery from a depression which has not been experienced by the trade in years. The buying comes from diversified industries, yet purchases in most instances have been confined to one or two machines, partly new and partly used, the latter predominating largely because of their good condition and the disparity of prices with new machinery. Another encouraging feature is that inquiries for machinery are coming from Europe and the Pacific Coast.

The Bettinger Enamel Corporation, River Street, Waltham, Mass., contemplates the erection of a one-story, 72 x 80 ft. plant on Pleasant Street, near the city line.

Bids will be asked about Oct. 25 for a New Bedford, Mass., high school addition to cost approximately $200,000, three-stories, 152 x 226 ft. Some 60 electric motors will

Longest Suspension Bridge Span Closed

WHEN Ex-Governor Benjamin B. Odell, Newburgh, N. Y., Drove the Last Rivet Completing the Structural Work on the Approaches to the Bear Mountain Bridge, the Longest Span of Any Suspension Bridge in the World Was Closed. The span is 1623 ft., compared with 1600 ft. in the Williamsburg Bridge, the present longest completed suspension bridge. Both will be exceeded when the Philadelphia-Camden Bridge is finished, but for the present the Bear Mountain Bridge is the longest. It is anticipated that it will be ready for use in January next. It will be a highway bridge without provision for either railroads or trolley cars and is the only highway bridge crossing the Hudson South of Albany

be required for a machine shop department. Brown & Poole, 688 Pleasant Street, New Bedford, are the architects.

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The Detroit City Gas Co., Detroit, is completing plans for a one-story addition to its meter repair and parts works, St. Aubin and Newton Avenues, 59 x 260 ft., to cost $50,000 including equipment.

The Board of Education, 1354 Broadway, Detroit, has plans for a two-story power house, 60 x 65 ft., at Tuxedo Avenue and La Salle Boulevard, and expects to place orders soon for equipment. McColl, Snyder & McLean, Penobscot Building, are engineers.

The Holleman Dewerred Automobile Co., 25 West Seventh Street, Holland, Mich., will erect a two-story service, repair and garage building, 110 x 190 ft., to cost about $35,000.

The Reo Motor Car Co., 4104 Woodward Avenue, Detroit, has work nearing completion on an addition, primarily for the production of motor buses and parts, including assembling.

A. N. Haskell, 2924 Lakeview Street, Detroit, is reported in the market for several motor-driven shapers and radial drills.

Fire, Sept. 29, destroyed a portion of the plant and equipment of the Durand Hoop Mfg. Co., Durand, Mich., entailing a loss of $30,000. Plans for rebuilding are under consideration. L. D. Young is general manager.

Pittsburgh

PITTSBURGH, Oct. 13.

MACHINE tool business in this district still is of very moderate proportions although sales of single tools are fairly numerous. Inquiry is somewhat better than a short time ago, but in not a few instances the request for prices is preliminary, and in some cases there are intimations that unless the result of the presidential election is favorable, the projected betterments will be deferred.

Contract has been let by the Struthers-Wells Co., Pennsylvania Avenue, Warren, Pa., manufacturer of iron and steel plates, etc., to the McClintic-Marshall Co., Pittsburgh, for a one-story addition estimated to cost $60,000. John T. Dillon is president.

The Pittsburgh Railways Co., 435 Sixth Avenue, Pittsburgh, has acquired property, 156 x 231 ft., adjoining its car barn and shop site at Second Avenue and Melanthon Street, and is reported to be planning the erection of additional such structures.

The Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, has awarded a general contract to Dwight P. Robinson & Co., 1300 Penn Avenue, Pittsburgh, for the erection of its proposed steam-operated electric generating plant at Shippingsport, Pa., to cost $15,000,000, with machinery and transmission lines.

The Capstan Glass Co., South Connellsville, Pa., has awarded a contract to the Austin Co., for three one-story additions, for about 50 per cent increase in present capacity, and to give employment to 200 additional men.

The Twelfth Street Garage, 81 Twelfth Street, Wheeling, W. Va., has awarded a general contract to the R. R. Kitchen Co., Nineteenth Street, for a four-story addition, 85 x 130 ft., to cost about $75,000. C. W. Bates, 77 Twelfth Street, is architect. C. A. Vaden is president.

E. H. Morford & Co., Moore Building, Charleston, W. Va., contractors, have inquiries out for an engine-generator set, from 200 to 400 kw., 250/125 volts, operating at 200 rpm.

The plant of the West Virginia Metal Products Corporation, Fairmont, W. Va., has been placed on the market. It consists of 27 acres improved with four buildings aggregating 156,480 sq. ft. of floor space, equipped for the manufacture of brass, steel and other metal products.

The Board of Education, Westmoreland, W. Va., is considering the installation of manual training equipment in its proposed two-story and basement high and grade school, estimated to cost $100,000. Meanor & Handlosher, Professional Building, Huntington, W. Va., are architects.

Whitehurst & Willard, I.O.O.F. Building, Charleston, W. Va., have inquiries out for a log loader, to operate on a 42-in. gage tram road.

H. S. Sinsel, P. O. Box 1225, Weirton, W. Va., is desirous of getting in touch with manufacturers of steel and wood tanks for water service.

The Terr-Put Auto Specialties Co., 7300 Race Street, Pittsburgh, manufacturer of automobile equipment, etc., has awarded a general contract to N. V. Watson, 6800 Kelly Boulevard, for a two-story and basement plant, 48 x 60 ft. S. A. Marstellan, 215 Wood Street, is architect. A. A. Tirrill is president.

J. D. Rockwell, Detroit, Mich., and associates have acquired the plant and properties on East Pleasant Street, Corry, Pa., of the Whittlesey Valve Cup Mfg. Co., idle for several months, and have plans under way for remodeling and the installation of new equipment to continue the production of cups for hydraulic machinery. The plant formerly manufactured cups for oil country use.

Indiana

INDIANAPOLIS, Oct. 13.

THE Tokheim Oil Tank & Pump Co., Wabash Avenue, Fort Wayne, Ind., has plans for a new three-story building for which bids will soon be asked on a general contract. Guy Mahurin, Standard Building, is architect. C. O. Griffin is secretary and treasurer.

The Northern Indiana Gas & Electric Co., Fort Wayne, Ind., is completing plans for a new generator building, steam power house, screening station, quenching station, and other structures, to cost $300,000 with equipment.

The Hoosier Foundry Co., Indianapolis, has leased property at the rear of 1022 East Michigan Street for a new foundry and plans to begin operations at an early date.

The Board of Education, Vincennes, Ind., plans the installation of manual training equipment at its proposed two-story and basement high school estimated to cost $225,000, for which plans are being drawn by J. P. Bayard, 231½ Main Street, architect.

The Western Brass Works, Indianapolis, has leased property at 1006 South Holmes Avenue and will operate a foundry for the production of brass and bronze castings, etc.

Foundations will be laid for a new manual training school at Terre Haute, Ind., to be known as the Gerstmeyer Vocational School, estimated to cost $85,000, for which contract has been let to the North-Raffin Construction Co., Terre Haute. Johnson, Miller, Miller & Yeager, 30 North Fifth Street, are architects.

South Atlantic States

BALTIMORE, Oct. 13.

TENTATIVE plans are being considered by the Hagerstown Motor Co., 117 Summit Avenue, Hagerstown, Md., for a three-story addition, 50 x 150 ft., estimated to cost $55,000. O. P. Bohman is president.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Oct. 21 for welding wire and rods, schedule 2759; steel tap screws, lag screws, machine screws, nuts and wood screws, schedule 2730; taps and dies for various yards, schedule 2747; until Oct. 28 for 7391 lb. phosphor bronze bars for the Mare Island Navy Yard, schedule 2744; until Nov. 4 for one electric-driven hoist for Mare Island, schedule 2767; until Oct. 21 for electric soldering and flat irons for various yards, schedule 2760.

The Pennsylvania Railroad Co., Philadelphia, has purchased property at Norfolk, Va., and is said to be planning the construction of an ice-manufacturing and car reicing plant, to cost close to $100,000 including equipment.

The Lee Chevrolet Sales Co., North Market Street, Frederick, Md., is taking bids on a general contract for a three-story automobile service, repair and garage building, 50 x 170 ft. J. O. Parsons is president.

The Southern Pulp & Naval Stores Co., 42 Broadway, New York, has acquired property at Dublin, Ga., and is reported to be planning the construction of a pulp mill on a portion of the site, estimated to cost close to $500,000 with machinery.

The chief of air service, United States Army, Washington, will take bids until Oct. 28 for a quantity of miscellaneous engine fittings, including ells, cocks, nipples, elbows, etc., circular 26; for 1000 generator camshaft coupling flanges, 500 gun control body assemblies, 500 generator camshafts, 100 vertical spacers, 400 thrust rod ends, 250 cable and bracket assembly, 500 impulse cable assembly, and 50 torque arm assemblies, circular 24; until Nov. 3 for 50 aircraft propellers, 2-blade, proposal CAS 28.

The Biltmore Ice Plant, Biltmore, N. C., is said to be completing arrangements for a new ice-manufacing plant, estimated to cost $90,000 including machinery. Fred Kent is general manager.

R. T. Lipscombe, 3 Graydon Court, Norfolk, Va., has inquiries out for machinery for a stone crushing plant, with capacity of about 1000 tons per day.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Rich-

mond, Va., machinery dealer, has inquiries out for two hoists, belt-driven, each with capacity of 2000 to 2500 lb., single or double drum.

The Common Council, Mooresboro, N. C., has tentative plans for the construction of a municipal electric light and power plant. It is proposed to vote bonds for the work.

The Harford Talc Co., 2222 Mt. Holly Street, Baltimore, is in the market for a quantity of 1¼-in. steel cable for a cableway.

The Atlantic Coast Line Railway Co., Waycross, Ga., has tentative plans for a new engine house and shops at Albany, Ga., estimated to cost $75,000. R. A. McCranie is division superintendent.

The Southern Box & Lumber Co., Louisville Road, Savannah, Ga., is completing plans for extensions and the installation of additional machinery to double the present capacity. It is arranging a bond issue of $75,000, the proceeds to be used for the expansion. G. H. Bierbaum is secretary.

Ottenheimer Brothers, Inc., 415 North Howard Street, Baltimore, manufacturer of refrigerators, refrigerating equipment, etc., is having plans drawn by Clyde N. and Nelson Friz, Lexington Building, architects, for extensions and improvements in its three-story factory, estimated to cost $75,000. Additional equipment will be installed.

The Hampton Road Steel Co., Seaboard Bank Building, Norfolk, Va., will build a two-story storage and distributing plant at Colley Avenue and Twenty-second Street, to cost approximately $30,000 with equipment. Wickham C. Taylor, Citizens' Bank Building, is architect.

The Alderman Mfg. Co., Rural Hall, N. C., recently organized with a capital of $200,000, has acquired a local building and plans the early installation of woodworking machinery and power equipment for the manufacture of toys and similar specialties. T. W. Alderman is secretary and manager.

Gulf States

BIRMINGHAM, Oct. 13.

M. G. JAMES, secretary, Board of Works, City Hall, Dallas, Tex., is taking bids until Oct. 24 for one centrifugal pump and accessory equipment, with capacity of 23,000,000 gal. per day, for installation at the Cadiz Street municipal pumping station. E. A. Kingsley, City Hall, is engineer.

The Texas Power & Light Co., Dallas, Tex., has closed negotiations for the purchase of the municipal light and power plant at Decatur, Tex., and will make extensions.

Owens Universal Joint & Gear Co., Inc., Lake Worth, Fla., has inquiries out a number of lathes, splining or slotting machines, for milling machines and other tools.

The Texarkana Cotton Compress Co., Texarkana, Tex., has preliminary plans for rebuilding the portion of its plant destroyed by fire Oct. 4, with loss estimated at $350,000 including equipment.

The City Commission, Lakeland, Fla., has plans under advisement for extensions and improvements in the municipal electric light and power house to cost $200,000, including additional equipment.

The Weston Sand & Gravel Co., Logtown, Miss., will establish a sand and gravel plant on about 80 acres and install machinery and power equipment for an initial output of approximately 15 cars per day. C. W. Weston is president.

The Mississippi Power & Light Co., Jackson, Miss., is said to have preliminary plans under advisement for a new steam-operated electric generating station in the vicinity of Columbus, Miss., estimated to cost close to $1,500,000 with equipment. C. P. Couch is vice-president and general manager.

The Southern Railway System, Mobile, Ala., division, plans to rebuild the portion of its coaling plant and chute at Selma, Ala., recently destroyed by fire with loss of $50,000, including equipment.

The Common Council, Sebring, Fla., has disposed of a bond issue of $135,000, the proceeds to be used for extensions in the municipal electric light and power plant and waterworks station, including additional equipment.

The Crane Co., 836 South Michigan Avenue, Chicago, has awarded a general contract to the St. John Co., Townley Building, Miami, Fla., for a local factory branch and distributing plant, 100 x 150 ft., to cost approximately $50,000. August Geiger, Calumet Building, Miami, is architect.

The Humble Oil & Refining Co., Houston, Tex., has tentative plans for a new oil storage and distributing plant at Fifth and Waller Streets, Austin, Tex., 60 x 280 ft., to cost $85,000 including equipment.

Pacific Coast

SAN FRANCISCO, Oct. 8.

BIDS are being taken on a general contract by the Pacific Electric Mfg. Co., 827 Folsom Street, San Francisco, for its one-story plant, 100 x 300 ft., estimated to cost $60,000. George H. Wiermeyer, 57 Post Street, is architect.

The Yuba Machine Shop, 216 Third Street, Marysville, Cal., operated by Charles Powell, has acquired property on Third Street, and plans the construction of a new machine shop to cost approximately $25,000.

Harlan Thomas, Arcade Building, Seattle, architect, will begin the construction of a seven-story automobile service, repair and garage building, 110 x 160 ft., at Union and First Streets, estimated to cost $200,000 with equipment. The Inter-Avenue Building Co., address noted, is interested in the project.

The Pioneer Box & Lumber Co., Mount Shasta, Cal., has preliminary plans for rebuilding the portion of its plant destroyed by fire Sept. 29, with loss estimated at $65,000.

The Deschutes Power Co., Prineville, Ore., is completing plans for the construction of a new power house in the Cove section, Bend, Ore., estimated to cost $150,000.

The Owen Oregon Lumber Co., Medford, Ore., has about 100 acres in this section and has plans under way for a new mill, to include machine shops, power house and other buildings estimated to cost $1,000,000 with machinery. James H. Owen is general manager.

The T. J. West Co., Bakersfield, Cal., is contemplating the construction of a new cotton compressing plant estimated to cost $150,000, of which about one-half will be used for compresses and auxiliary machinery. H. A. Jastro is president.

Veness & Brewer, Winlock, Wash., will begin the erection of an addition to their sawmill and lumber plant, estimated to cost $40,000 with machinery.

The Oregon Casket Co., 101 North Fifth Street, Portland, Ore., will take bids for a new four-story and basement plant, 75 x 200 ft., to cost approximately $140,000 with machinery. Sutton & Whitney, Lewis Building, are architects.

The Consumers Ice Co., 436 Eighth Street, San Francisco, is arranging for the construction of a one-story ice-manufacturing plant at Oakland, estimated to cost $70,000 with machinery.

The Long-Bell Lumber Co., Longview, Wash., has awarded a general contract to C. A. Mitchell, Ryderwood, Wash., for a one-story machine shop, 90 x 156 ft., at its plant in the vicinity of Ryderwood.

Canada

TORONTO, Oct. 13.

WHILE the demand for machine tools shows practically no change a good volume of business is pending on which orders are expected to close before the end of the year. General improvement in sales of electrical equipment is reported and several fair sized lists are being prepared. During the week orders from the mining fields of northern Ontario appeared in the local market and it is stated that other business of this nature will soon be closed.

The Southern Canada Power Co., Drummondville, Que., will receive bids, on which awards will be made in about a month, for $100,000 worth of electrical equipment. The inquiry includes two 6,000 kva. vertical generators, and two 6000-hp., single-runner, vertical hydraulic turbines, with oil pressure type governors, as well as switchboard control equipment. Several high-tension transformers to step up the current from the generating voltage to 43,000 volts for transmission will also be purchased. L. C. Haskell is secretary-treasurer of the company.

The Dominion Sheet Metal Corporation, Hamilton, Ont., is having plans prepared for an extension and the installation of additional equipment.

A. Paradis, Cabano, Que., is in the market for a drill, lathe, grinder and other tools.

Selkirk & Henderson, Warsaw, Ont., will purchase a portable drill and lathe.

The Sticht Architectural Iron & Bronze Works, Montreal, is building a plant for the manufacture of grills, stairs, railings, castings etc., and is in the market for equipment. S. C. Foster, 101 Belgrave Avenue, is secretary.

H. T. Warne, Digby, N. S., is in the market for two new steam boilers and one engine.

Plans of New Companies

The McDaniel Wrench Co., Room 1101, 165 Broadway, New York, incorporated with $200,000 capital stock, will manufacture a new type of adjustable socket wrench. As soon as organization matters are cleared away, the company will make plans for manufacturing by contract. Distribution is to be handled through the New York office. W. R. Dorr, V. Morrison and J. B. Niver are the incorporators.

The Meadon's Blower & Pipe Works, Messerole Avenue, Brooklyn, has been incorporated with $50,000 capital stock to manufacture exhaust fan and mechanical draft equipment. Its plant is fully equipped and operations are now under way. George I. and W. A. Meadon are the principals.

The Bontempi Scultograph Corporation of America care of M. E. Joffe, 111 Broadway, New York, was recently incorporated with $250,000 capital stock to undertake the manufacture of sculpturing machinery. It is planning to manufacture in that city, but no decision has been made as to the plant location, and it is estimated that about two months will be required for the completion of preliminary matters. G. A. Flanagan, E. Eiseman and W. S. Coffin are the incorporators.

Masseeley, Inc., 263 Ninth Avenue, New York, incorporated with $50,000 capital stock, will act as distributor for manufacturers of printing and embossing machinery and parts. W. A. McPhail is manager.

The Everhot Corporation, 19-21 Dover Green, Dover, Del., has been incorporated with $100,000 capital stock to manufacture mechanical products. It is yet in the formative state. J. M. Bing, 152 West Forty-second Street, New York, is president.

Buffalo Ignition Sales, Inc., has been organized with $50,000 capital stock, of which $30,000 has been invested in cash, and has acquired the business interests of Henry & Ferguson, Inc., also the Clarence D. Ferguson Co., both of which were distributors of automotive equipment. Business will be continued along the same lines.

The A. T. Smith Electric Co., Inc., Winsted, Conn., has been incorporated to manufacture radio products, having taken over the assets and business of an established company. E. C. McDermott is one of the heads.

The Self Seal Container Mfg. Co., Inc., P. O. Box 172, Wilmington, Del., has been incorporated with $1,000,000 capital stock to manufacture metal containers. Detailed plans for manufacturing are not available at this time. W. C. Nenstiehl is president and Walter L. Hanf, secretary-treasurer.

The General Mfg. & Electric Co., Elwood City, Pa., has been organized to manufacture various electrical products, such as transformers, spark plugs, etc.

The Burton Bronze Co., 1460 Buchanan Avenue, S. W., Grand Rapids, Mich., has been incorporated to manufacture power plant equipment. Work is nearly finished on the company's plant and six oil burning furnaces, together with general machinery have been installed. It is expected that more machinery will be added next spring. Burton T. Moore is president.

The Automatic Heating Co., 2705 Avenue G, Birmingham, which has been organized to install and distribute heating equipment, will require such materials and equipment as are necessary for installation. F. O. Stone is president-treasurer.

The Cooke Boiler Works, 265 Nichol Street, New Haven, Conn., recently incorporated with capital stock of $50,000, has constructed a plant and will manufacture boilers, heaters, tanks and other plate products. Most of the equipment has been purchased but the company is still in the market for a few small machines.

Bachrach & Co., care of Emil Ortner, 1373 South First Street, Louisville, Ky., has been incorporated with capital stock of $30,000 and is conducting a general scrap iron business. M. Bachrach is president-treasurer.

The Camden Metal Co., 517 Federal Street, Camden, N. J., incorporated with capital stock of $100,000, will engage in buying and selling scrap metals. P. H. Harding is one of the heads.

The Pittsburgh Lightning Rod Co., Oakmont, Pa., organized with nominal capital of $1,500, will manufacture lightning rods. James W. Macfarlane, Woodland Road, Pittsburgh, is treasurer.

The J. E. Grady Co., 4480 Cass Avenue, Detroit, organized to manufacture oil burners, will have all work for the present done by contract. J. E. Grady heads the company.

The Townsend Mining & Smelting Co., Boston Building, Denver, has been organized to operate mining and smelting properties, having taken over deposits and plant which have been in production and are ready for operation. Equipment is complete, the only requirements being repair parts. W. D. Woodriff is one of the principals.

The Novelty Mfg. Co., Baltimore, has been organized to manufacture metal buttons, manicure sets and specialties for the automotive trade. Two floors have been leased, comprising 10,000 sq. ft., and preparations will be made to get under way as soon as possible. Louis Schmidt is president. Address in care of William E. Smith, Bush and Wicomico Streets.

The Enterprise Sheet Metal Works, New Orleans, has been incorporated to manufacture sheet metal products. Fred C. Huff, 713 Bartholomew Street, is president.

R. Hoe & Co., Inc., is successor to the interests of R. Hoe & Co., 504 Grand Street, New York, manufacturer of printing presses, saws, etc. It has plants at Dunellen, N. J., and in London, England, besides the New York works. New financing has been provided by the sale of $4,000,000 of preferred stock, part to be used in improvements.

The Ryan Car Co., Chicago, with a railroad car manufacturing and repair shop at Hegewisch, Ill., heretofore controlled by James M. Hopkins, president Ryan Car Co. and chairman of the board of directors of the Camel Co., Chicago, and W. W. Darrow, vice-president of the Camel Co., has been acquired by a syndicate headed by John M. Burnham & Co., Chicago. William W. Ryan, formerly president Ryan Car Co. and at present president Youngstown Steel Car Co., Niles, Ohio, has been elected president of the new company, and R. D. Bartlett continues as secretary-treasurer and assistant to the president. T. H. Goodnow, vice-president Ryan Car Co., has resigned to become vice-president of the Camel Co., with headquarters at Chicago.

The Driggs Ordnance & Engineering Co., New York, has been incorporated with capital stock of $250,000 and 5000 shares of common stock, no par value, to manufacture fire arms and ammunition. It has taken over the business of the Driggs Ordnance & Mfg. Corporation, which has been in receivership since about a year ago. Under the plan of reorganization the same personnel will conduct affairs at the plant in New Haven, Conn. The company's corporate representatives in New York are Hays & Buckley, 43 Exchange Place.

The Silent Typewriter Corporation, care of C. A. Spear, 79 Wall Street, New York, incorporated with capital stock of $20,000, plans to manufacture typewriter platens. Operations will be delayed for a considerable length of time while organization matters are being perfected. It is planned eventually to establish a plant in New York. No contracts have been placed as yet.

The Wollmar Engineering Corporation, 224 East Forty-second Street, New York, has been incorporated with capital stock of $20,000 to manufacture and deal in iron and steel products. Plans are not yet known definitely. A. F. and S. Wollmar are the principals.

Business Changes

The Wagner Electric Corporation of St. Louis announces the removal of its New York service station to larger quarters at 321 West Fifty-fourth Street, P. K. Winter continuing in charge.

Weirton Steel Co. has opened a Philadelphia office in the Packard Building, Fifteenth and Chestnut Streets. L. P. Lane is district sales manager.

The Richey-Rhynearson Co., Indianapolis, has changed its name to the Richey-Whaley Machinery Co., located as formerly at 23-25 East South Street.

The Cameron & Barkley Co., Charleston, S. C., has been appointed district representative for the Central Iron & Steel Co., Harrisburg, Pa., in the Charleston district.

The Framingham Mfg. Co., Framingham, Mass., has changed its name to the Continental Valve & Equipment Co., manufacturer of high pressure valves and fittings.

The Martin Metals Corporation, 115 Monroe Street, Newark, N. J., manufacturer of brass, bronze and aluminum castings, metal patterns, sheet and wire products, has changed its name to the Martin Metals Foundries, Inc.

The Eastern Fuel Co. has opened an office at 638 Equitable Building, Baltimore, in charge of Hall Hammond.

The name of Tucker & Lewis, Inc., general contractors, has been changed to Tucker Construction Co., with L. E. Tucker as president and Frank C. Boes, as vice-president. Headquarters will remain at 103 Park Avenue, New York.

NEW TRADE PUBLICATIONS

Adjustable Reamers.—Brown-McLaren Mfg. Co., Detroit. Catalog describing and illustrating Connell adjustable reamers and screw machine products of this company. The booklet contains price lists of shell reamers, chucking reamers, hand reamers, special reamers, blades and other parts. Several pages of the catalog are devoted to illustrations of the various types of screw machine products made by this company.

Gages.—C. E. Johansson, Inc., Poughkeepsie, N. Y., now a division of the Ford Motor Co. A 46-page illustrated booklet showing various types of Johansson gages for precision measurement.

Used Machine Tools.—Hill, Clarke & Co., Chicago. A list of "remanufactured" machine tools published in a booklet called the "Green List." Practically all types of standard machine tools of various makes are listed. The company claims to have the largest stock of high grade machine tools in the world.

Ovens.—The Detroit Sheet Metal Works, Detroit. A 6-page booklet describing and illustrating ovens designed by this company for use in various industrial processes. Illustrations show a continuous type body oven under construction at the plant of the Chevrolet Motor Co.

Sand Blast Equipment.—W. W. Sly Mfg. Co., Cleveland. Bulletin S-110, 12 pages, entitled "Slyblast Rooms." This outlines the uses of sand blasting, points out its advantages and describes with illustrations sand blast room construction and various types of sand blast rooms as built by this company and adapted for specific sand blasting problems. The bulletin points out the outstanding features of the various types from the production standpoint.

Industrial Buildings.—Truscon Steel Co., Youngstown, Ohio. Booklet of 8 pages. Describes various construction features and gives brief description of the new foundry of the Studebaker Corporation, South Bend, Ind. Particular attention is given to the lighting and ventilation of this plant and illustrations show the design and construction of the continuous sash which are electrically controlled. The installation of the windows and their operating equipment was handled by the Truscon company. The building has over 4½ acres of window space. Continuous window sections, 600 ft. in length, are opened and closed by touching a button.

Automatic Electric Station Equipment.—General Electric Co., Schenectady, N. Y. A 27-page bulletin on automatic control equipment, designated as No. 47731. Describes briefly uses and advantages. The greater part of the bulletin is given over to a list of installations up to Jan. 1, 1924, giving the name of the company, station, type of apparatus, kilowatt capacity and incoming and outgoing voltage.

Screw Products.—The Union Screw & Mfg. Co., 420 Neptune Street, Pittsburgh. Catalog containing besides descriptions of the company's products, latest list price on U. S. S. hex head, square head, S. A. E. hex head, fillister and flat head cap screws; standard set screws, milled studs, milled coupling bolts and nuts, table showing forms of threads for both the U. S. S. and V standard, S. A. E. standard dimensions, approximate weight of steel and brass bars per foot of length, table of screw threads, micrometer callipers, table of decimal equivalents of screw gage, distance across corners of square and hex bars, fractions of 1 in. reduced to decimal equivalents and the net of discounts.

Chains.—Morse Chain Co., Ithaca, N. Y. Bulletin No. 26A devoted to small power drives; bulletin No. 24 devoted to large power drives; bulletin No. 27, consisting of a series of testimonial letters of various users of Morse chains, and a booklet entitled "Power," its Application from the Seventeenth Dynasty to the Twentieth Century, a reprint of an address by F. L. Morse at the twenty-sixth annual convention of the American Mining Congress at Milwaukee, Sept. 27, 1923. Bulletins Nos. 24 and 26A give complete information regarding the various uses of the Morse silent chain drives and both are well illustrated with types of equipment in which these chain drives are used.

Meters.—Sangamo Electric Co., Springfield, Ill. Bulletin No. 68 illustrating and describing amperehour meters produced by this company for various purposes.

Steam Shovels.—The Osgood Co., Marion, Ohio. Bulletin No. 247, which gives a brief history of the development of standard railroad shovels and also serves the purpose of introducing the Osgood continuous treads for railroad type shovels.

Conveyors.—Sterns Conveyor Co., Cleveland. Catalog No. 102, 80 pages, illustrated, listing company's products such as belt conveyors, bucket elevators, pan conveyors, rotary and shaking screens, pivoted bucket carriers, idlers and lehr conveyors. Catalog shows installations of complete conveyor equipment made by this company in practically every line of industry.

Chain Hoist.—Motorbloc Corporation, Summerdale, Philadelphia. A 4-page illustrated bulletin giving information regarding Motorbloc motor driven chain hoists, which can also be hand operated when necessary. One illustration shows the use of a Motorbloc chain hoist in the foundry, another shows the Motorbloc hoist serving a large planer and another shows its use in connection with a milling machine.

Gears.—Boston Gear Works Sales Co., Norfolk, Downs, Mass. A pocket-size, 24-page circular designated as No. C3-24. Covers various products of this company including helical gears, hardened steel thrust washers, iron internal gears, steel spiral miter gears, cut iron spur gears, heavy type worm gears, single thread steel worms and semi-steel worm gears, speed reduction units, sprockets, steel chain and flexible couplings.

Flooring.—The Norton Co., Worcester, Mass. A 24-page illustrated booklet showing Alundum floors which are suitable for use in buildings of various types. A few illustrations point out practicability for factory floors, a special point being made of durability where heavy trucking is done.

Truck Casters.—Faultless Caster Co., Evansville, Ind. An 8-page bulletin with illustrations and information regarding Faultless truck casters, emphasis being placed on the durability of these casters for heavy trucking.

Motors.—Century Electric Co., St. Louis. A 12-page illustrated booklet devoted to Century squirrel cage induction polyphase motors from 1/6 to 75 hp. The company also manufactures other types of motors.

Die Head.—Landis Machine Co., Waynesboro, Pa. A 12-page bulletin featuring installation views of the Land-Matic Die Head. The bulletin shows the use of this die head in various manufacturing processes.

Property Appraisal.—The American Appraisal Co., Milwaukee. A 32-page booklet giving a record of various profitable uses of appraisal reports.

Stokers.—Illinois Stoker Co., Alton, Ill. Third edition of Catalog L, giving illustrations and description of the use of type A (natural draft) and type G (forced draft) Illinois chain grate stokers. A feature of the catalog is a number of blue print drawings listing the use of both forced and natural draft stokers in connection with all of the principal types and makes of boilers.

Pumps.—Aldrich Pump Co., Allentown, Pa. Bulletins Nos. 50 and 82, giving engineering data on pumping of water and oil. Bulletin No. 82 illustrates and describes the Aldrich high pressure road pumps.

Steam Purifier.—Andrews-Bradshaw Co. Record of a survey, at the plant of the Robert Gair Co., of Tracy steam purifiers for avoiding foaming and thus improving superheating and engine performance. The pamphlet records a net saving in this plant of $4,619 per year, compared with an initial cost for the installation of about $3,000. The greatest portion of this saving is credited to a higher average superheat and a more efficient operation of the engines.

Heating Apparatus.—Warren Webster & Co., Camden, N. J. Booklet containing a series of remarkable airplane photographs of 24 cities in this country, incidentally illustrating Webster heating system specialties.

Vacuum Pumps.—Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York. Bulletin No. 711, a 24-page publication, devoted to the subject of vacuum, and the Crescent vacuum pumps.

A general description of the new Brooklyn plant of the E. W. Bliss Co., Fifty-third Street, Brooklyn, N. Y., is given in a booklet of 16 pages, designated as publication No. 47. The plant is made up of a group of 16 buildings and is 5 ft. less than ⅓ mi. long. Beginning with the engineering department views are given of the foundry and forge shops, various machining departments and the assembly and erecting shops. Pages are devoted to illustrations of interesting installations of the stamping presses and other metal working machinery manufactured by the company.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

Bars:	Per Lb.
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	6.75c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.25c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.50c.
Toe-calk, ½ x ⅝ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.05c.
Square, flats and hex.	4.55c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c. to 4.45c.	.....
Nos. 22 and 24	4.45c. to 4.60c.	5.10c.
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	.....

Galvanized

	Per Lb.
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt	—41	—24	⅛ in. Butt	— 4	+19
¼ in. Butt	—46	—32	¼ in. Butt	—11	+ 9
1-3 in. Butt	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap	— 5	+ 14
7-8 in. Lap	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap	—34	— 6	7-12 in. Lap	— 3	+16

Bolts and Screws

Machine bolts, cut thread, 50 to 50 and 10 per cent off list

Carriage bolts, cut thread, 40 to 40, 10 and 10 per cent off list

Coach screws, 50 to 50 and 10 per cent off list

Wood screws, flat head iron, 75, 20, 10 and 10 per cent off list

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16⅞c. to 18⅜c.
High brass wire	17⅜c. to 18⅜c.
Brass rods	14⅝c. to 15⅝c.
Brass tube, brazed	24⅞c. to 25⅝c.
Brass tube, seamless	21 c. to 22 c.
Copper tube, seamless	22¼c. to 23¼c.

Copper Sheets

Sheet copper, hot rolled, 20⅛c. to 20⅝c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Bright Tin Grade "A" Charcoal 14x20	Coke—14 x 20	Prime	Seconds
		80 lb.	$6.15	$5.90
		90 lb.	6.30	6.05
		100 lb.	6.45	6.20
IC. $11.25	$8.85	IC.	6.65	6.40
IX. 12.85	10.85	IX.	7.85	7.60
IXX. 14.40	12.55	IXX.	9.00	8.75
IXXX. 15.75	13.85	IXXX.	10.35	10.10
IXXXX. 17.00	15.05	IXXXX.	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	52c.
Bar	56c. to 60c.

Copper

Lake ingot	16 c.
Electrolytic	15½c.
Casting	14½c.

Spelter and Sheet Zinc

Western Spelter	7½c.
Sheet zinc, No. 9 base, casks	10.85c. open 11.60c.

Lead and Solder*

American pig lead	9c. to 9½c.
Bar lead	11c. to 12c.
Solder, ½ and ½ guaranteed	38c.
No. 1 solder	35c.
Refined solder	29c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	13c. to 14c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.

Old Metals

The market continues quiet and dealers' buying prices are unchanged as follows:

	Cents Per Lb.
Copper, heavy crucible	11.00
Copper, heavy wire	10.50
Copper, light bottoms	9.00
Brass, heavy	6.50
Brass, light	5.00
Heavy machine composition	8.00
No. 1 yellow brass turnings	7.00
No. 1 red brass or composition turnings	7.50
Lead, heavy	6.75
Lead, tea	5.00
Zinc	3.75
Cast aluminum	16.00
Sheet aluminum	16.00